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ADDRESSES AND ORIGINAL ARTICLES

SOME DEFICIENCIES OF NUTRITION AND THEIR RELATION TO DISEASE *

BY CHARLES C. UNGLEY, M.D. Durh., F.R.C.P. Lond.

ASSISTANT PHYSICIAN, ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE; LEVERHULME RESEARCH SCHOLAR, ROYAL COLLEGE OF PHYSICIANS OF LONDON

I—ORIGIN AND DETECTION OF NUTRITIONAL DEFICIENCIES

As long ago as 1880 Samuel Fenwick observed the atrophy of the stomach in pernicious anæmia and appreciated the fact that an abnormal state of the gastro-intestinal tract might give rise to nutritional deficiency irrespective of the adequacy of the diet. It has remained for Castle, nearly fifty years later, to prove by experiment the theory of "conditioned" deficiencies in nutrition. It is now realised that in temperate climates diseases of deficient nutrition are more frequently caused by gastro-intestinal disturbances affecting the assimilation of food than by inadequate diets (Strauss 1934).

Causes of Nutritional Deficiencies

I shall consider causes under the following headings: factors adversely affecting food intake; factors leading to impairment of digestion and absorption; deficiencies of essential food elements conditioned by the composition of the rest of the diet; factors increasing the demands for nutrient elements or the rate at which they are katabolised; and other factors.

FACTORS ADVERSELY AFFECTING FOOD INTAKE

I do not need to stress the rôle of poverty, ignorance in the selection and cooking of foods, and the excessive use of refined, sterilised, canned, or otherwise commercialised products. "The best fed members of the population to-day, while getting twice as much vitamin B_1 as people on a low income level, yet consume less vitamin B_1 than the parish poor of the eighteenth and early nineteenth century" (Baker, Wright, and Drummond 1937).

Individuals living under isolated conditions, particularly men "left to the mercy of their own culinary incompetence," are liable to eat peculiar diets. I have encountered 3 cases of scurvy, aptly called by Meulengracht "bachelor scurvy," in men doing their own housekeeping. Xerophthalmia occurred in a young Indian canvasser, one of a group of coloured men living in a single room cooking (and currying) their own food. Idiopathic hypochromic anæmia, unusual in the male, was observed in an unmarried miner whose chief meal of the day consisted in oatmeal and milk. An epileptic youth who lived almost entirely on white bread and butter and tea developed a severe anæmia which responded to liver extract.

Food fads and fancies are sometimes a cause of deficient nutrition. Beri-beri in a vegetarian, and in a negro woman who ate large quantities of raw starch for its alleged cosmetic value, are amongst the reported examples (Brauchle 1933 and Kepler 1925). A young woman developed wet beri-beri after living on a meagre diet to check her obesity (Riesman and Davidson 1934).

Prescribed diets for ulcer, colitis, nephritis, hypertension, and diabetes sometimes lead to avitaminosis. A diabetic woman, on a very restricted diet, developed a beriberi-like state and a condition resembling xerophthalmia (Wohl 1926). A seaman because of ulcer symptoms restricted his diet to rice and developed beri-beri (see Lect. III). Rigid dieting for gastric ulcer may lead to scurvy (Martin 1931 and Barling 1935); lesser degrees of hypovitaminosis C are not infrequent (see Ingalls and Warren 1937). Meulengracht and Rothe Meyer (1937) described 4 cases of osteomalacia of the spinal column in one of which the deficient diet had been prescribed for dyspepsia and vigorously adhered to for five years.

Amongst other causes of inadequate food intake may be mentioned loss of appetite, nausea, sore mouth, imperfect teeth, dysphagia, pain in relation to food, and psychological disturbances.

FACTORS LEADING TO IMPAIRMENT OF DIGESTION AND ABSORPTION

When pellagra or beri-beri occurs in temperate climates the cause is usually alcohol addiction, or some disease of the alimentary tract. The rôle of alcohol is not a primary one in these conditions (see Lect. III).

Deficiency of digestive juices is important in the anæmias (see Lect. II). Achylia is often associated with increased capillary fragility which may fail to respond to vitamin C unless the latter is given parenterally (Schultzer 1935). Deficient absorption due to achlorhydria is believed to accentuate the B_1-avitaminosis sometimes encountered in chronic alcoholism, pregnancy, and gastro-intestinal disorders. Lack of pancreatic juice or of bile impairs the assimilation of fats and fat-soluble vitamins.

Gross anatomical lesions like peptic ulcer and carcinoma may lead to deficiency states because pain, vomiting, or anorexia limits food intake. But associated disorders of motility, digestion, and absorption also contribute by impairing the assimilation of food.

Pellagra secondary to diseases of the gastro-intestinal tract has often been described (see Strauss 1934, Simpson 1935, and Yudkin, Hawksley, and Drummond 1938). In many instances the diet had been entirely adequate for the prevention of pellagra in an individual with a normal alimentary tract. Other complications of gastro-intestinal disorders include beri-beri (see Lect. III), nutritional œdema, tetany, and occasionally scurvy.

In cœliac disease, non-tropical sprue, and other forms of idiopathic steatorrhœa, along with failure to retain ingested fat, there may be imperfect absorption of other nutrient factors. For example, 5 cases of idiopathic steatorrhœa recently investigated showed evidence of deficient absorption of calcium such as osteoporosis, osteomalacia, late rickets, and tetany, and other signs of deficiency such as nutritional œdema, nyctalo-hemeralopia, atrophic tongue, and anæmia. Sprue-like diarrhœa with other evidences of deficient absorption may result from obstruction of the lacteals by tuberculosis (Ryle 1924) or lymphadenoma (Fairley and Mackie 1937), or from tumour plaques on the intestinal wall (Lundsteen 1937).

Psychological factors influence not only the quantity and quality of food eaten but also its assimilation. The motor and secretory functions of the gastro-intestinal tract are affected by pain, fear, and anxiety (see Ivy 1934).

* The Goulstonian lectures for 1938, delivered before the Royal College of Physicians of London on March 3rd, 8th, and 10th. Lects. II and III will appear in later issues.

DEFICIENCIES OF ESSENTIAL FOOD FACTORS CONDITIONED BY THE COMPOSITION OF THE REST OF THE DIET

The adequacy of a diet in respect to a single component thereof is to some extent dependent on the nature of the other constituents. Vitamin B_1 plays a part in the metabolism of carbohydrate, which in the absence of the vitamin may be halted at the stage of pyruvic acid (Peters 1936). Given a fixed (low) intake of vitamin B_1 per unit of body-weight, signs of deficiency will appear more rapidly the higher the total calorie intake. Thus in chronic alcoholism a high intake of calories as alcohol may accentuate the results of low intake of vitamin B_1.

The administration of drugs may interfere with nutrition. The alkalis given in the treatment of peptic ulcer appear to hinder the absorption of iron (Kellogg and Mettier 1936). Feeding large doses of iron to rats may so impair phosphorus absorption that rickets is the result (Brock and Diamond 1934).

FACTORS WHICH INCREASE THE DEMANDS FOR NUTRIENT ELEMENTS OR THE RATE AT WHICH THEY ARE KATABOLISED

Vitamins take an intimate part in cell metabolism, and anything which increases the metabolic rate may lead to an increased katabolism or "using up" of these substances. This relationship has been well demonstrated in the case of vitamin B_1 by Cowgill (1934) but probably applies to most of the vitamins. The rate of metabolism is increased by hard muscular work, fever, pregnancy, and certain endocrine disorders such as hyperthyroidism.

Hard muscular work is often a factor in the causation of pellagra (Ellinger, Hassan, and Taha 1937) and of beri-beri. Some pellagra cases improve spontaneously as soon as they are put to bed, even on a "pellagra producing" diet. "Bachelor scurvy" may improve under conditions of rest in hospital even although a diet deficient in vitamin C is given and the ascorbic acid content of the serum remains low (see Fig. 6). Men suffering from xerophthalmia and night-blindness have been known to improve on ceasing employment only to relapse once more when they start work (Spence, personal communication). An Indian with xerophthalmia and nyctalo-hemeralopia showed rapid improvement in his power of distinction when kept at rest in hospital on a diet low in vitamin A (see Fig. 3). The nutritional importance of sufficiently long hours of rest and sleep is probably partly dependent on the diminution of katabolic activities at these times.

Infections can give rise to nutritional deficiency by impairing the appetite and the assimilation of food, but important factors are the rise of metabolic rate and the wasting of tissues which accompany fever. Infection is often the exciting factor which renders manifest a long-existing latent vitamin deficiency—e.g., in beri-beri and in infantile scurvy.

Nutritional deficiencies often make their first appearance during *pregnancy*—e.g., deficiency anæmias, osteomalacia, and beri-beri. Pregnancy is associated with a 20 per cent. increase in basal metabolic rate. In addition, the demands of the fœtus for essential food factors are often supplied at the expense of the mother. Intractable vomiting sometimes plays a part. Edmund and Clemmesen (1937) found nyctalo-hemeralopia in a considerable proportion of 68 pregnant women admitted to their department.

Rapid *growth* is associated with increased metabolism and increased requirement for essential food factors. Infants of small birth-weight rapidly use up their stores of iron and tend to develop anæmia. The requirement for certain minerals and vitamins per kg. of body-weight is much greater in the child than in the adult.

Hyperthyroidism leads to increased metabolism, but because the appetite is usually excellent outspoken nutritional deficiencies are not common. I have recently seen an unmarried postwoman, aged 53, known to have had exophthalmic goitre for at least 15 years, who now presents a clinical picture resembling osteomalacia, with bones which bend or break on slight provocation.

OTHER FACTORS IN THE ÆTIOLOGY OF DEFICIENCIES OF NUTRITION

Loss of nutrient elements occurs at parturition and menstruation, during lactation, and as a result of bleeding from any cause. Excessive excretion of vitamins, hæmopoietic factors, or other nutrient materials possibly takes place under certain circumstances. A low renal threshold might conceivably predispose to depletion of the bodily reserves of vitamin C (see later). Vogt-Møller (1936) has described a case of diabetes insipidus complicated by slight symptoms of pellagra.

Defective storage or imperfect utilisation of vitamin A has been postulated as the cause of keratomalacia associated with liver disease (see Owen and Hennessey 1932).

Individual variations in susceptibility to dietary deficiency have been observed both clinically and experimentally. They may be *hereditary*: in areas where pellagra is endemic, many cases occur in certain families whereas other families on the same diet escape entirely. The inheritance of a tendency to achlorhydria is also important. Deficiency diseases such as beri-beri, rickets, and "subclinical scurvy" may appear in early infancy as the result of deficiency in the mother. Observations in rats by French and Bloomfield (1937) suggest that *previous deficiency* may leave an individual more susceptible to a recurrence of the deficiency.

Some Effects of Deprivation of Nutrient Substances

Of particular significance is the effect of deficient nutrition on the functions of the alimentary tract; when vitamin deficiency causes anorexia, achlorhydria, or other gastro-intestinal disturbances, these may then lead to deficient intake and impaired assimilation of essential food factors, so that a vicious circle is set up. According to Hellström and others (1937) persons living on a "milk-meal" diet deficient in meat, green vegetables, and fruit, show a higher incidence of digestive troubles and of achlorhydria than persons taking a more varied dietary.

It is by no means certain that the ulcers produced by dietary deficiency in animals have any relation to peptic ulcer in man. There is little published evidence that diets of high vitamin content yield clinical results in ulcer cases. Vitamin-C deficiency is not an ætiological factor (Schultzer 1934).

Nutritional deficiency has important effects upon intestinal function: diarrhœa is a common complication, for example, in beri-beri and in pellagra. A condition resembling sprue has been produced by feeding dogs on a diet deficient in vitamin B_2 (Miller and Rhoads 1933). The injection of crude liver extracts is said to diminish the rate of passage of the intestinal contents in tropical sprue (Mackie, Miller, and Rhoads 1935). Vitamin-B_1 deficiency is possibly an occasional cause of gastro-intestinal hypotonia (Vorhaus, Williams, and Waterman 1935), while ulcerative colitis may sometimes be the result

of dietary deficiency (McCarrison 1920, Tilden and Miller 1930, Mackie and Chitre 1928, Larimore 1928).

Cardiovascular system.—The most important effects of deficient nutrition on the cardiovascular system are found in association with vitamin-B_1 deficiency. The clinical symptoms and signs, the blood chemistry, the myocardial changes, the hæmodynamics, and therapeutic responses correspond to those described in "beri-beri heart" in the orient. The disease as observed in temperate climates, however, is characterised by more varied and more generalised involvement of the cardiovascular system (Weiss and Wilkins 1937a and b). A causative relationship between vitamin-C deficiency and rheumatic fever probably does not exist (see Parsons 1938, Schultz 1936).

FIG. 1.—Looser's zone of metaplasia in the tibia.

Respiratory system.—Vitamin-A deficiency is attended by metaplasia of the epithelium of alveoli and terminal bronchi, one result of which is that the lung is less resistant to infections. The incidence of bronchitis and pneumonia is higher in children of poor families than in the better nourished offspring of the professional classes (Spence and Charles 1934). Hoarseness and aphonia are frequent symptoms in beri-beri and occurred in a case to be described later, in which polyneuritis and B_1-avitaminosis followed faulty gastro-enterostomy. The same patient also suffered from a peculiar type of "silent broncho-pneumonia," which may or may not have been related to the deficiency state; the radiographic changes simulated acute pulmonary tuberculosis but disappeared completely in a few weeks.

Urinary tract.—Vitamin-A deficiency in rats is commonly associated with urinary calculi: the causative factors appear to be keratinisation of the urinary epithelium, infection, and the change to alkaline urine. The stones disappear when the diet is corrected. Vermooten (1937) has recently reviewed the relation of diet to calculi in man and pointed out that the South African negro who lives on a diet rich in vitamin A and extremely low in calcium does not form calculi.

Tetany and *skeletal changes* such as rickets, osteoporosis, and osteomalacia are especially liable to occur in idiopathic steatorrhœa and other types of chronic diarrhœa; in some forms of nephritis (renal rickets); in persons on a diet low in vitamin D or mineral salts, especially if deprived of sunlight; and in certain endocrine disorders such as hyperthyroidism. Osteoporosis is also seen in scurvy. I have reported elsewhere the case of a woman of 54 who suffered from osteoporosis and brittle bones combined with a clinical picture resembling pernicious anæmia (Ungley and James 1934).

The significance of Looser's metaplastic zones is uncertain, but it has been suggested that they are nutritional in origin. I have 3 cases of this kind under observation at the present time: a man 53 years of age with an old gastro-enterostomy, hypochromic anæmia, and mild nervous manifestations; a woman aged 70 who also had osteo-arthritis of hip; and a boy of 12 with mild hypochromic anæmia. In the first two cases the lesion was in both femora, and in the third patient one tibia was affected (Fig. 1). Blood calcium and phosphorus values were invariably normal. The blood phosphatase values were 19·2, 6·6, and 17·7 units respectively. Both adults had complete histamine-refractory achlorhydria, and the boy had low acidity. Schopfer's test for vitamin B_1 gave a normal value in the man and a low value (6 μg. per 100 c.cm.) in the woman. In two cases there have been signs of healing under the influence of calcium and vitamin D.

Infection.—Extreme depletion of vitamin A leads to metaplasia of epithelial tissues and lowers their resistance to invading organisms. It has not yet been definitely proved, however, that subclinical forms of vitamin-A deficiency play a considerable part in the susceptibility to infection.

Detection of Nutritional Deficiencies

The clinical features of the classical deficiency diseases are well known, but in this country are rarely encountered. On the other hand less severe deprivation of vitamins, although widespread and of great importance in disease, is difficult to detect.

Attempts should be made to elicit details of the *diet* (*a*) before and (*b*) during the present illness. The former is important from the point of view of the cause of the illness, the latter for the interpretation of the significance of any deficiencies discovered. Because a diseased person showed vitamin deficiencies, it does not follow that the disease is the result of the deficiencies: the converse may be the case.

Certain points in the physical examination are useful in assessing the state of nutrition: the weight, height, and general condition of the patient; the texture of the hair, the tone of the muscles, and the lustre of the eyes; the colour of the palms of the hands and the mucous membranes; the texture of the skin and the presence or absence of pigmentation, hyperkeratinisation, petechiæ, &c.; the nails, whether brittle or spoon-shaped; the state of the teeth and the gums; and the presence or absence of atrophy of the papillæ of the tongue, or sores at the angles of the mouth.

Observations on nail-growth by a technique recommended by Prof. Le Gros Clark (personal communication) have yielded information of interest, but their value in routine nutritional studies has yet to be assessed. The possible utility of estimating the cystein content of nail-clippings (Sullivan, Howard, and Hess 1937) needs further investigation.

DETECTION OF DEFECTS IN DIGESTION AND ABSORPTION

In some cases we have used continuous aspiration with the double tube of Agren and Lagerlöf (1936), with the object of performing quantitative estimations on uncontaminated gastric juice. By this method one can also study the secretory activity of the pancreas in response to secretin (Agren, Lagerlöf, and Berglund 1936) and, if desired, the function of the gall-bladder. To determine the presence of Castle's intrinsic factor by biological assay is a lengthy process, and the value of chemical procedures for this purpose is uncertain.

A careful radiological examination is essential in studying the functions of the stomach and intestine, especially with regard to motility.

Useful tests for intestinal absorption include: macroscopic and microscopic examination of the stools and fat analysis; comparison of the oral glucose-tolerance curve with an intravenous one (Ross 1936a, b, and c); time of appearance of iodine in saliva after giving potassium iodide (see Heath and Fullerton 1935); and the rate of excretion of sugars such as galactose or xylose after oral administration (Singer and Wechsler 1934, Helmer and Fouts 1937).

Intubation of the small intestine provides a more direct method of measuring absorption and may prove to be of great value in studying intestinal function in relation to deficiency states (Abbott and Miller 1936, Owles 1937, Groen 1937, Groen and Taylor 1937).

Vitamin A.—In the dietary history special attention should be paid to the intake of food rich in vitamin A and carotene. Examination should be made for morbid processes which might interfere with the use of fats, such as diseases of the biliary system and pancreas, vomiting, or diarrhœa.

Visual dysadaptation (nyctalo-hemeralopia) is the earliest manifestation of vitamin-A deficiency: vitamin A is necessary for the regeneration of visual purple after it has been bleached by light. Children may be observed to stumble into objects when playing at dusk. Adults find difficulty in driving at night and accidents have resulted from slowness of visual adaptation following exposure to the dazzle of approaching headlights. Some patients complain of "eyestrain," blurring of vision, or specks in front of the eyes, especially when reading by artificial light.

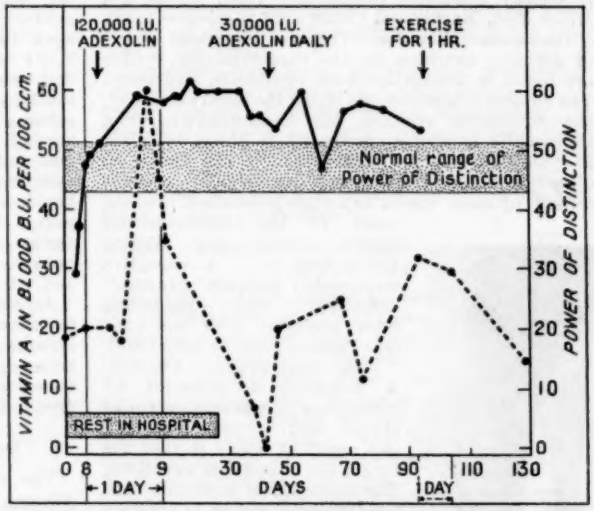
120,000 I.U. ADEXOLIN
30,000 I.U. ADEXOLIN DAILY
EXERCISE FOR 1 HR.
VITAMIN A IN BLOOD B.U. PER 100 ccm.
POWER OF DISTINCTION
Normal range of Power of Distinction
REST IN HOSPITAL
0 6 9 30 50 70 90 110 130
1 DAY
DAYS
1 DAY

FIG. 3.—The results of tests for visual dysadaptation (nyctalo-hemeralopia) and for vitamin A in the blood in a case of xerophthalmia. Rapid improvement in the power of distinction occurred with rest in bed before vitamin A was given.

Xerophthalmia is now rarely encountered in this country, although a number of children and adults in the North of England were affected during a prolonged coal strike in 1926 (Spence 1931). The only case we have encountered recently was in an Indian canvasser aged 24. The disease commenced two years previously in India, and he had never for long been free from the symptoms. Visual adaptation became normal within a few days (Fig. 3) but the Bitot's spots persisted even after months of treatment.

Lesser degrees of xerosis may be recognisable as dull or cloudy areas on the conjunctiva after the eyes have been held open for 3–5 minutes (Sweet and K'ang 1935). Stained smears from the bulbar conjunctiva examined microscopically may show keratinisation of the epithelial cells.

Some cases of vitamin-A deficiency are accompanied by a characteristic follicular hyperkeratosis called by Nicholls (1933) phrynoderma (toad-skin). The dry atrophic state of the dermis may give rise to the appearance known as "giraffe-skin" (Wright, quoted by Rao 1937). I have seen both toad-skin and giraffe-skin in a man with scurvy, whose visual adaptation was poor.

Spence (personal communication) has observed that the healing of an artificially produced skin lesion (burn) is much slower than normal in persons deficient in vitamin A. The urine often contains excess of epithelial cells or even pus.

Marked dysadaptation is often found even in the absence of symptoms. We have used the technique of Edmund and Clemmesen (1936) as modified by Mutch

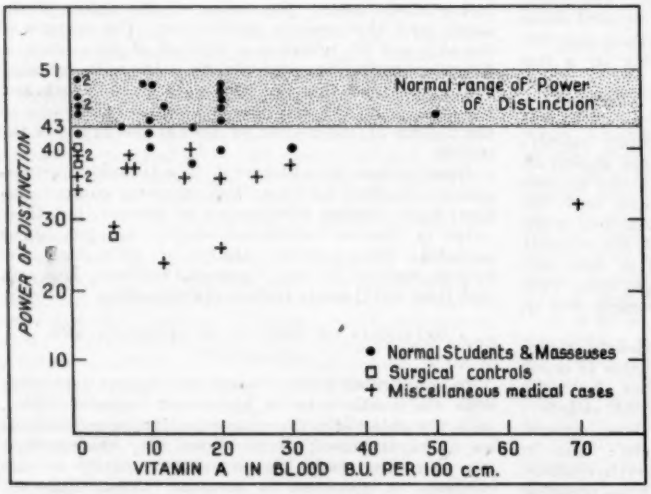
POWER OF DISTINCTION
Normal range of Power of Distinction
Normal Students & Masseuses
Surgical controls
Miscellaneous medical cases
VITAMIN A IN BLOOD B.U. PER 100 ccm.

FIG. 2.—It will be noted that normal students and masseuses mostly showed a power of distinction which fell within the normal range, whereas hospital patients (mostly selected cases) were subnormal in this respect. There was no correlation between power of distinction and the amount of vitamin A in the blood. It has been found convenient to express the results of each visual test as a figure rather than a curve. For this purpose the power of distinction is expressed as the total number of test cards visible through Tscherning glasses 1 to 8. For example, if the faintest letter seen through glass 1 is No. 1·75, the patient is assumed to be able to see all letters more distinct than this and the total number of cards visible at this degree of illumination will be 8. To this figure is added the number of cards visible through glasses 2 to 8, and the total obtained is an expression of the power of distinction.

and Griffiths (1937).† We have seldom observed any significant improvement with practice but it is nevertheless desirable that before giving vitamin A the test should be repeated more than once, or until the readings are constant. Low readings cannot be accepted with certainty as evidence of vitamin-A deficiency unless the administration of vitamin A by mouth or by injection leads to definite improvement.

In association with Prof. J. C. Drummond values for *vitamin A in the blood* and the effect of giving vitamin A by mouth or injection have been determined in a series of normal and diseased persons. Wide fluctuations occur which show little or no correlation with the results of visual dysadaptation tests (Figs. 2 and 3). The carotene content of the blood varies much less than the amount of vitamin A. Curves of blood values showing rates of absorption after the ingestion of 120,000 I.U. of vitamin A (as Adexolin) are shown in Fig. 4. It is our experience that nothing of diagnostic value can be obtained from estimation of vitamin A in the blood.

Vitamin B_1.—Valuable information as to the likelihood of deficiency can be obtained from the application of Cowgill's formula (Cowgill 1934) provided that the vitamin-B_1 intake, the patient's weight, and if possible the caloric intake are known. The clinical indications of possible vitamin-B_1 deficiency include anorexia, cardiovascular manifestations (particularly tachycardia, œdema, and heart failure), aphonia, polyneuritis, and Korsakoff's psychosis. The deficiency is most likely to be encountered in infants, alcohol addicts, pregnant women, and persons suffering from gastro-intestinal disorders. Investigations should include radiographic determination of the size of the heart and electrocardiography. In the presence of vitamin-B_1 deficiency the injection of 1 mg. of adrenaline intravenously produced a rapid fall of diastolic blood pressure, sometimes to zero, with the appearance of "pistol shot" sounds over the arteries of the limbs (Aalsmeer 1932). The procedure must be used with caution.

Various biochemical tests for vitamin-B_1 deficiency have been devised:—

(*a*) *Bisulphate-binding substances* (*chiefly pyruvic acid*) are increased in the blood in experimental B_1-avitaminosis (Thompson and Johnson 1935) and in fulminating beri-beri (Platt and Lu 1936). In less severe vitamin-B_1 deficiency the finding is inconstant and it is in any case not specific (Wilkins et al. 1937).

(*b*) *Estimation of vitamin* B_1 *in the blood.*—In Schopfer's test it is arranged that the growth of a mould *Phycomyces blakesleeanus* is specifically catalysed by minute amounts of vitamin B_1. The method has been applied to blood by Meiklejohn (1937). Low values have been obtained in cases of polyneuritis, which on clinical grounds were believed to be nutritional in origin, and in most cases of idiopathic hypochromic anæmia, but not in pernicious anæmia and subacute combined degeneration of the cord (see Lects. II and III).

(*c*) *Estimation of vitamin-*B_1 *excretion in the urine.*—

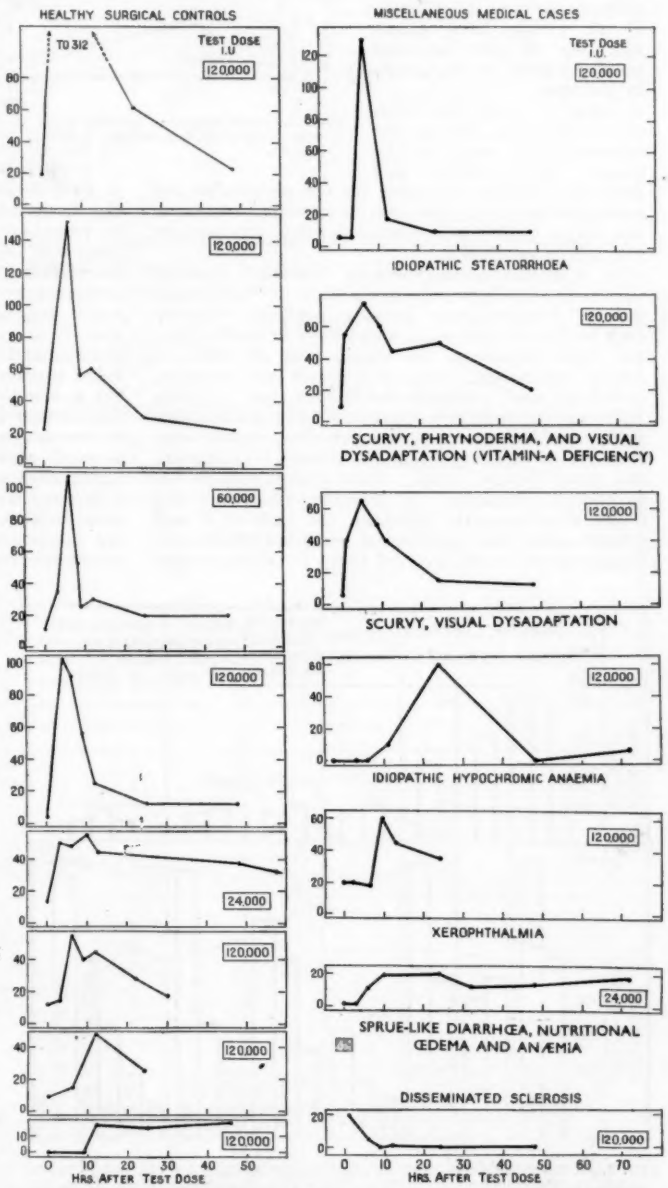

FIG. 4.—Curves showing values of vitamin A in the blood after test doses of vitamin A (usually 120,000 I.U.) as adexolin. There are wide variations both in health and disease, and at present it would seem that the test has no diagnostic value.

† For other methods see Maitra and Harris (1937), Jeans, Blanchard, and Zentmire (1937), and (applicable to infants) Friderichsen and Edmund (1937a and b).

Harris, Leong, and I (1938) have reported results obtained using the bradycardia test. Simpler and more accurate are the recently described chemical methods (Westerbrink and Goudsmit 1937, Karrer 1937, and Pyke 1937). Some results obtained using a modification of the method of Karrer and Kubli (1937) are shown in Fig. 5.

Vitamin-B_2 complex.—No satisfactory clinical test is available for detecting the heat-stable components of the original vitamin B. Elfinger et al. (1937) have drawn attention to the increased porphyrinuria which occurs in pellagra.

Vitamins C and P.—Vitamin C plays a rôle in the respiration of cells, in the process of oxidation and reduction, and is responsible for the production and maintenance of the intercellular cement substances. Deficiency results in imperfect dentine, osteoporosis, and fragile capillaries.

In otherwise normal persons decreased *capillary resistance* sometimes indicates a state of "subclinical scurvy." In diseased persons capillary fragility may be due to other causes and even in health there are wide variations, the significance of which is poorly understood. Several methods are available, including the modified tourniquet test (Göthlin 1937) and the suction method (see Eddy and Dalldorf 1937, and Schultzer 1934). Another factor concerned with capillary fragility is vitamin P (Rusznyak and Szent-Györgyi 1936). Pure P-avitaminosis has no clinical symptoms. If, however, vitamins C and P are simultaneously withheld, the lack of P will greatly modify the pathological condition (Benthsath, Rusznyak, and Szent-Györgyi 1937). In our experience neither ascorbic acid nor vitamins C and P together in lemon juice have any influence on thrombocytopenic purpura.

Estimation of vitamin C in blood and urine.—The use of 2 : 6 dichlorphenolindophenol as an indicator has the disadvantage that this dye is reduced not only by vitamin C but by other substances in urine which must first be removed. In the present investigation the vitamin-C content of the blood and urine has been estimated by the method of Lund and Lieck (1937) which depends on the decolorisation of methylene-blue in the presence of strong artificial light. The vitamin usually appears in the urine when the serum value reaches about 1 mg. per 100 c.cm. of blood, but a low threshold is sometimes observed (Fig. 7). The resting level in the serum varies considerably in normal persons and at different seasons (Lund, personal communication). Normally, however, the ingestion of a single dose of 600 mg. of ascorbic acid is followed within three hours by a rise in the serum value to above 1 mg. per 100 c.cm. of blood and by the appearance of the vitamin in the urine. In scurvy the resting serum ascorbic acid value is low and only a small rise follows the ingestion of a test dose of 600 mg. With repeated test doses the ascorbic acid content of the serum rises gradually in step-ladder fashion until the threshold value is exceeded and the vitamin appears in the urine (Fig. 6).

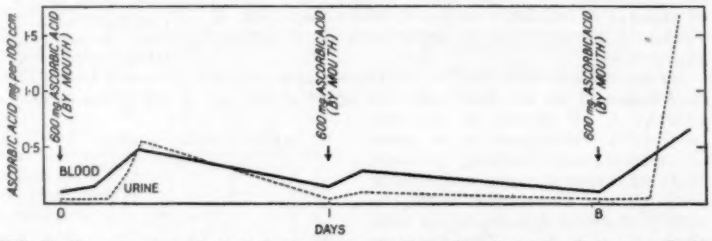

FIG. 7.—Poor responses to test doses of vitamin C (orally administered) in an epileptic with nutritional macrocytic anæmia. The renal threshold for vitamin C is low (cf. Fig. 6).

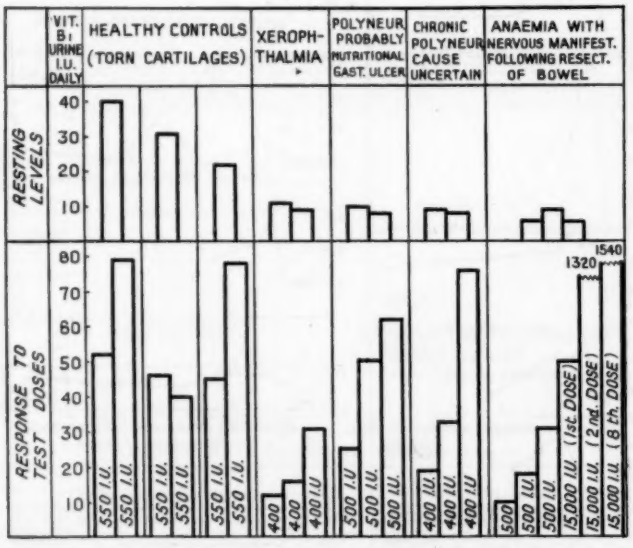

FIG. 5.—A few illustrative cases to show results of tests for vitamin B_1 in the urine by the thiochrome method. The effect of giving vitamin B_1 on the amount of vitamin excreted in the urine is shown. None of these patients showed a gross degree of vitamin-B_1 deficiency. Cases with severe B_1-avitaminosis, in which the urine was tested by the bradycardia method, have shown no response whatever to test doses (Harris, Leong, and Ungley 1938; see also Lect. III).

Since failure to show a response to ingested ascorbic acid may be due to deficient absorption, it is desirable, in certain instances, to compare the effect of giving the test dose parenterally. Ascorbic acid is oxidised in the intestine and absorbed as dehydro-ascorbic acid. In chronic intestinal lesions the power of reducing dehydro-ascorbic acid may be impaired. In such cases lemon juice is more effective than synthetic ascorbic acid (Elmby and Warburg 1937, Lund and Elmby 1938).

An intradermal test for vitamin-C deficiency depending on the rate of decolorisation of 2 : 6 dichlorphenol-indophenol by the tissues has been described (Rotter 1937; see also Portnoy and Wilkinson 1938).

* * *

In this lecture I have reviewed the causes and effects of nutritional deficiencies and the ways in which they may be detected. My second and

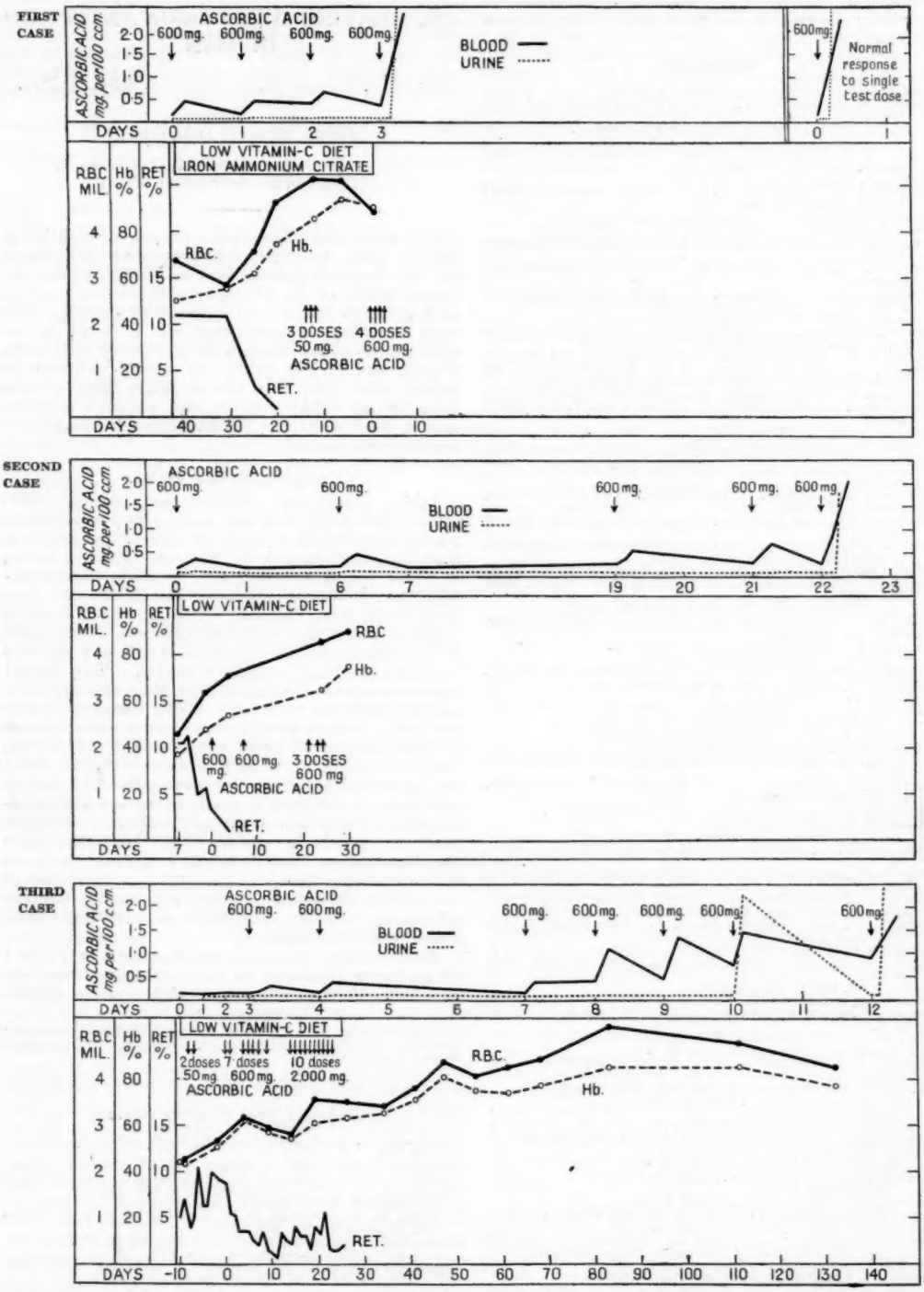

FIG. 6.—Three cases of "bachelor scurvy," showing the effect of test doses on vitamin-C content of the blood and urine. The hæmatological observations will be referred to in Lect. II.

third lectures will describe results obtained by the application of these principles to the study of deficiency diseases of the blood and of the nervous system.

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THE SCHICK REACTION AND CIRCULATING DIPHTHERIA ANTITOXIN IN MAN

BY H. J. PARISH, M.D., M.R.C.P. Edin., D.P.H.

AND

JOYCE WRIGHT, D.M. Oxon.*

(*From the Wellcome Physiological Research Laboratories, Beckenham, Kent*)

THE occurrence of a number of cases of diphtheria, mostly mild, amongst Schick-negative individuals has led to investigations and criticism, notably by Jensen (1931), of the reliability of the Schick reaction as a guide to immunity to clinical diphtheria. The work described in this paper was initiated by an epidemic of 8 such cases in an immunised institution (Parish and Wright 1935). It seemed desirable to inquire once again into the antitoxin titres of sera from human Schick-positive and negative reactors, and to see if a definite "Schick level of immunity" could be established.

"SCHICK LEVEL" IN MAN

Schick (1913) and Michiels and Schick (1913) stated that 0·033 unit per c.cm. was the antitoxic level above which a negative and below which a positive reaction might be anticipated. Later, v. Gröer and Kassowitz (1915) found in one Schick-negative reactor only 0·01 unit and in two not more than 0·004 unit. Schick, v. Gröer, and Kassowitz (1924) reported that 0·002 unit per c.cm. is correlated with indefinite positive reactions and that with 0·005 unit the reactions may be negative. Since heated toxin was not used as control fluid, the results recorded in these early papers are not strictly comparable with our own. Originally either no control was employed or it consisted of toxin neutralised by antitoxin. Further, certain of the early workers withdrew blood for antitoxin titration 2–7 days after the Schick test—i.e., at the time of reading—instead of immediately before injection. Obviously the former procedure tends to give higher values than the latter, since the injection of Schick toxin frequently acts as a "secondary stimulus," producing a rapid rise of circulating antitoxin in the potentially immune (Copeman, O'Brien, Eagleton, and Glenny 1922, Parish and Okell 1928).

Jensen (1931) communicated the data in Table I of antitoxin titrations of blood samples from four groups of children—naturally Schick-negative, Schick-

* Now working with a Medical Research Council fellowship; formerly assistant bacteriologist, Wellcome Physiological Research Laboratories.

(*Continued from previous column*)

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negative after immunisation, Schick-positive before immunisation, and Schick-positive after immunisation. He showed that the large majority of Schick-positive children before immunisation had less than 0·0005 unit of antitoxin per c.cm.; nearly 30 per cent. of naturally Schick-negative children had less than 0·01 unit per c.cm. and a certain number as little as 0·0005 unit per c.cm.; a few Schick-negative persons had lower amounts. Jensen drew the following conclusions from this and previous work:—

TABLE I—SCHICK TEST AND CIRCULATING ANTITOXIN TITRE (AFTER JENSEN)

No. tested.	Schick readings.	Antitoxin titre in units per c.cm.				
		Over 0·03	0·03–0·01	0·01–0·005	0·005–0·0005	Under 0·0005
29	Naturally negative (%).	48	24	7	7	14
179	Negative after immunisation (%).	67	24	4	4·5	0·5
135	Positive before immunisation (%).	0	0	1·5	8·9	89·6
32	Positive after immunisation (%).	0	22	15	44	19

1. A Schick-positive reaction has real importance, since it always indicates (100 per cent. of cases) that the antitoxin titre of the serum is less than 0·03 unit per c.cm. (in 96 per cent. of cases less than 0·01 unit per c.cm.).
2. In subjects naturally Schick-positive a strong positive reaction signifies in 90 per cent. of cases an antitoxin level of less than 0·0005 unit per c.cm.
3. Children possessing practically no antitoxin—i.e., less than 0·0005 unit per c.cm.—in their blood may nevertheless have a Schick-negative reaction.
4. There is no fixed antitoxin titre (0·03–0·01 unit per c.cm.—the "Schick level") at which individuals pass from the negative to the positive group or vice versa. This titre presents considerable variation from individual to individual.

Jensen thus confirmed in human subjects the pronounced variation in titre previously noted in certain titrations in guinea-pigs by Glenny and Waddington (1929) in their study of the relationship between antitoxin content of the blood and tolerance for toxin. He also affirmed that it was useless to do a primary Schick test because of the fallacies introduced.

Dudley, May, and O'Flynn (1934) regarded as unimportant the very few exceptions to the rule that "for practical purposes in most environments a positive Schick test, in all subjects except young infants, means there is less than 0·01 unit of A.T. per c.cm. of blood and a negative Schick test more than 0·01 unit of A.T. per c.cm. of blood at the moment of the test injection." These observers also stated that the intensity of the Schick reaction is not invariably proportional to the antitoxic content of the serum. For example, when the blood was taken on the same day as the Schick test, 2 of 9 boys who had no detectable circulating antitoxin gave only weak positive Schick readings, whereas others who had antitoxin were strongly positive.

Our preliminary data (Parish and Wright 1935) suggested that the "Schick level" in man was subject to considerable individual variation and that some subjects with as little antitoxin as 0·004–0·002 unit per c.cm. might be Schick-negative. Leach and Pöch (1935) found that 28 (14·3 per cent.) of 196 Schick-negative children had less than 0·01 unit per c.cm. and that 3 had less than 0·0005 unit per c.cm. Brandon and Fraser (1936) and Taylor and Moloney (1937) made parallel tests with the Schick reagents issued by fourteen licencees of the Treasury Department of the United States. Marked differences in the interpretations of the Schick tests were frequently observed, but it is noted that in almost all cases the toxins used did not conform with the standard requirements formulated by the League of Nations. Further, diluted toxoid was often used instead of heated toxin as the control fluid. We have made numerous observations in which Schick toxin, Schick control (heated toxin), and Moloney test fluid (diluted toxoid) were injected into human subjects on the same occasion; these have shown considerable discrepancies in the size of the reactions resulting from the injection of heated toxin and of diluted toxoid. The use of diluted toxoid instead of heated toxin as the control fluid might thus in certain cases result in an erroneous reading of the Schick reaction. Finally, Taylor and Moloney recommended the use of fresh Schick toxins (containing little toxoid) of at least three times the toxicity recommended by the League of Nations. The issue of a more toxic preparation would not be welcomed by a number of clinicians in this country, who regard the reactions produced by the current product as sufficiently intense.

In view of the confusing and often contradictory statements in the literature, further investigation seemed advisable. If the data presented later in this paper are comparatively scanty, they appear to us to be worthy of publication, and have afforded us an opportunity of reviewing the scientific basis and usefulness of the Schick test.

THE "SCHICK LEVEL" IN ANIMALS

Glenny and Waddington (1929) prepared "multiple Schick toxins" (from toxin and toxoid) with combining powers from 1/2 to 200 times that of the single Schick toxin. Each of these contained the same amount of free toxin as the routine standard Schick toxin, and therefore produced in the non-immune guinea-pig the same degree of skin reaction. In the immunised guinea-pig it was possible by the intracutaneous injection of these "multiple toxins" to detect varying degrees of immunity depending on the alteration of the combining power by additional toxoid. The authors concluded that in guinea-pigs the "Schick level" lies between 0·002 and 0·004 unit per c.cm., although it is noted that there were some marked variations in "level" in individual animals. For example, of eight guinea-pigs with a negative reaction to a twofold Schick toxin, one had as little as 0·0005 unit of antitoxin per c.cm., one had 0·002 unit, and six had amounts ranging from 0·004 to 0·04 unit.

REAGENTS AND TECHNIQUE

It is necessary to comment briefly on the reagents we used and on their standardisation.

The Schick dose of toxin was originally fixed by Schick as 1/50th of the minimal lethal dose for a guinea-pig. Glenny (1925) pointed out that the combining power of Schick test toxin should also be defined. In 1931 the Health Section of the League of Nations adopted 1/750th–1/1250th unit as the standard combining power of a single Schick dose of toxin. Recommendations were also made for the toxicity of the reagents; when injected intracutaneously into a normal guinea-pig, 1/25th of a Schick dose should cause a positive reaction, and 1/50th of a dose no reaction. In Great Britain these conditions have to be fulfilled under the Therapeutic Substances Regulations (1931), which include in addition a definition of the Schick control fluid.

In the first part of our research the Schick toxin and control conformed to all these regulations, the

control in each case being the corresponding toxin dilution heated at 85° C. for 30 minutes. At a later stage we made some experiments with "multiple Schick toxins" of the same toxicity as the ordinary material, but with additional toxoid giving a combining power four and ten times as great. We refer to these preparations as *fourfold* and *tenfold* Schick toxins. The control in each case was the corresponding toxin dilution heated at 85° C. for 30 minutes.

Injections of Schick reagents were made in the case of children into the flexor aspects of the forearms and in most adults into the extensor surfaces of the thighs just above the knees. The volume of each injection was 0·2 c.cm. The Schick reactions were read at various periods after injection, the final readings, on which our conclusions were based, being made on the 7th day. Blood samples were taken *immediately before* the Schick tests were performed. The antitoxin titres were titrated by our colleague, Mr. A. T. Glenny, by a modification of the Römer method, involving intracutaneous injection into guinea-pigs (Glenny and Llewellyn-Jones 1931).

With regard to the accuracy of the figures, it is necessary to direct attention to the method of titration. Dilutions of serum were tested on a twofold range, as a closer series did not appear to be necessary. In the majority of cases the value allotted to the serum meant that the titre was more than a certain unitage and less than twice that unitage. In a few instances a very small difference between two reactions may have determined which of two values —e.g., 0·004 or 0·002 unit of antitoxin per c.cm.—was allotted to a given serum.

THE SCHICK TEST (ROUTINE REAGENTS) AND CIRCULATING ANTITOXIN

Almost all the persons tested had been positive on a previous primary Schick test, and had received one or more injections of diphtheria prophylactic. Samples of blood were taken about four weeks after the first or second injection of prophylactic when many would be expected to show "border-line" immunity, and few would have either no antitoxin or very high values. The Schick tests were performed immediately after the blood samples were taken; 114 persons were available, mostly young adults (volunteers of our laboratory staff and probationer nurses at a general hospital) and children over 9 years of age at a residential institution. The results are shown in Table II.

TABLE II—SCHICK TEST (ROUTINE REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 114 PERSONS

Schick readings.	Antitoxin titre in units per c.cm.				
	0·05 or more	0·05–0·01	0·01–0·002	0·002–0·0005	Under 0·0005
Negative	27	6	8	9	..
Pseudo-negative ..	9	..	4	2	..
Doubtful pseudo-negative	..	..	1	..	..
Positive	..	..	2	31	5
Pseudo-positive ..	1	..	..	5	..
Doubtful pseudo-positive	1	..	2	1	..
Total tested ..	38	6	17	48	5

Note.—A titre of 0·01 but not 0·05 is shown as 0·05–0·01 and not as 0·01–0·002 unit per c.cm. Similarly, 0·002 is shown as 0·01–0·002 and not as 0·002–0·0005 unit per c.cm.

On the basis of the Schick readings, the antitoxin titres could be placed in three groups, as follows:—

(1) 0·01 unit or more per c.cm.—the highest value in our series was 50 units—in which no positive Schick reaction was found, with the exception of one pseudo-positive (2 units) and one doubtful pseudo-positive reaction (0·2 unit), which might have been due to errors in reading. As is well known pseudo-reactions may be difficult to interpret.

(2) 0·01 unit to 0·0005 unit—in which there was considerable variation in the Schick reaction, positive reactions of different intensity, and negative or doubtful reactions being found. Further, some of the reactions in this zone were difficult to read owing to their early or late appearance, or to faint or transient reddening. In this group 11 persons (9, if 2 pseudo-reactors are omitted) who were Schick-negative had less than 0·002 unit of circulating antitoxin per c.cm. of serum.

(3) Less than 0·0005 unit per c.cm.—in which only positive reactions occurred, definite and easily read at the 7th day.

These data are slightly different from those of Jensen, who found some Schick-negative reactors having less than 0·0005 unit. It is possible that further work would confirm his findings, our present series being limited to 114, as against 337 subjects examined by him. Our work, however, confirms his view that it is not possible to fix any definite circulating antitoxin level as the "Schick level of immunity." There appears to be a wide zone of antitoxin titres corresponding to variable reactions.

THE QUANTITATIVE TEST AND CIRCULATING ANTITOXIN

With a view to international agreement on the Schick test dose, the Health Section of the League of Nations in 1931 provided for investigation two Schick toxins differing rather widely in their combining power for antitoxin. Toxin A was neutralised by 0·001 unit of antitoxin—i.e., was equivalent to ordinary Schick toxin—whereas Toxin B was neutralised by 0·003 unit; both contained the *same amount of toxin* and different amounts of toxoid. With each toxin was supplied a corresponding "control" of heated toxin. Jensen (1931) reported the circulating antitoxin titres corresponding to the Schick reactions produced in human subjects by these reagents. He found that, as in the case of reactions produced by ordinary Schick toxin, there was considerable individual variation in the results —e.g., negative reactions to both toxins corresponded in one subject with 0·002 unit per c.cm. and positive reactions to both toxins in another with 0·02 unit per c.cm.

Chesney (1935 and 1937) and Thomas (1937) found that fourfold Schick reagents gave a higher percentage of positive reactions than the ordinary reagents, but as routine blood samples were not taken it has not been possible to correlate these readings with titres of circulating antitoxin.

We ourselves (Parish and Wright 1935) have already published the results of preliminary experiments with "multiple Schick toxins." The results of our present series of investigations with fourfold Schick toxin and control are shown in Table III, and with tenfold in Table IV.

Altogether 61 individuals were tested with fourfold and 39, some of whom belonged to the same group, with tenfold reagents. Almost all the readings were negative to both fourfold and tenfold Schick reagents, when the antitoxin content of the serum was 0·002 unit or more. There were 5 exceptions—viz., 2 positive reactions and 3 doubtful pseudo-positive reactions with more than 0·01 unit of antitoxin

per c.cm. At titres of 0·002 unit or less as many as 5 out of 25 Schick reactions were negative to the fourfold reagents. With the tenfold reagents 2 negative reactions were recorded with 0·01 to 0·002 unit, and 9 positive reactions were recorded with 0·002 to 0·0005 unit, but one of these was only faint. With both fourfold and tenfold reagents the occurrence of pseudo-reactions often made readings difficult and may have given rise to errors in interpretation. The pseudo-reactions were much more intense with "multiple reagents" than with the ordinary routine preparations; a number of subjects complained of discomfort for some days after injections, and three volunteers of our laboratory staff had to have dressings to allay irritation. The routine use of these preparations in their present form cannot therefore be recommended.

TABLE III—SCHICK TEST ("FOURFOLD" REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 61 PERSONS

Schick readings.	Antitoxin titre in units per c.cm.			
	0·05 or more	0·05–0·01	0·01–0·002	0·002–0·0005
Negative	23	2	2	5
Pseudo-negative ..	4	1	..	..
Positive	..	1	..	15
Pseudo-positive	..	..	..	4
Doubtful pseudo-positive	3	..	..	1
Total tested ..	30	4	2	25

TABLE IV—SCHICK TEST ("TENFOLD" REAGENTS) AND CIRCULATING ANTITOXIN TITRE: 39 PERSONS

Negative	13	5	2	..
Pseudo-negative ..	8	1	..	..
Positive	1	..	..	9
Total tested ..	22	6	2	9

TABLE V—RESPONSE TO SMALL SPECIFIC STIMULI OF PERSONS WITH LOW ANTITOXIN TITRES ASSOCIATED WITH NEGATIVE SCHICK READINGS

No. of case.	Antitoxin titre in units per c.cm. (March 21st).	Re-Schick injection (March 21st), reading (March 27th).	Antitoxin titre in units per c.cm. (March 27th).
1	0·001	Negative.	0·04
2	Under 0·001	„	0·004
3	0·001	„	0·004
4	0·0005	„	0·04

CIRCULATING ANTITOXIN AND RELATIVE IMMUNITY TO CLINICAL DIPHTHERIA

It is necessary to inquire whether individuals with little circulating antitoxin but a Schick-negative reading are relatively immune to clinical diphtheria. The following observations were made at a school in North London. Blood samples were obtained from 20 children, who were all Schick-positive when read on Feb. 13th or 20th, 1935, and were injected with 0·5 or 1·0 c.cm. of alum-precipitated toxoid (A.P.T.). Table V gives the subsequent history of 4 of them.

The particular interest of these figures lies in (*a*) the low titre of circulating antitoxin associated with a negative Schick reading six days later, and (*b*) the rapid increase in circulating antitoxin within six days of the stimulus of the Schick injection. The figures throw some light on individuals with a low titre of circulating antitoxin but a Schick-negative reaction; a number of these persons are obviously relatively immune and respond readily to the specific stimulus of diphtheria toxin. Of the remaining 16 children 10, who had very little circulating antitoxin on March 21st, 1935, were re-Schick-positive on that date; they showed little or no increase in circulating antitoxin six days after the re-Schick test. Clearly they had much less potential immunity than the 4 children in the first group. The other 6 children had considerable amounts of circulating antitoxin on March 21st, 1935, and were re-Schick-negative on that date.

DISCUSSION

It has long been known (see Glenny 1925) that animals which have once been actively immune remain potentially immune and react to a specific stimulus—e.g., diphtheria toxin—by producing large amounts of the corresponding antibody. Even such a small dose of toxin as is injected in the Schick test may elicit this response. This was first shown in guinea-pigs, but O'Brien (1926) and Parish and Okell (1928) made similar observations in human subjects. Individuals who had once been Schick-negative might relapse to the positive state and have little or no circulating antitoxin in their serum; they were sometimes negative again within one week of the re-Schick test, and showed a considerable increase in antitoxin. The data presented in Table V indicate that persons who are Schick-negative with a low titre of circulating antitoxin may also respond well to a small secondary stimulus. Clearly some persons are more responsive to secondary stimuli than others, their response depending partly on their previous experience of diphtheria toxin or of prophylactic preparations, and partly on individual differences in ability to train the antibody-producing mechanism.

The occurrence of clinical diphtheria implies a weakness of the patient's defences. Either there is insufficient circulating antitoxin to withstand the attack, or the response is not sufficiently rapid to make good the deficiency. Little is known about the antibacterial factors concerned in immunity to diphtheria. Certain gravis and intermediate strains would appear to have greater invasiveness than other strains, and give rise to a more severe type of infection in man; in quantitative virulence tests in guinea-pigs, however, the differences between strains are not so marked, antitoxin prepared with the Park Williams 8 strain being effective against all strains irrespective of their type.

Diphtheria occasionally attacks a person who has once been Schick-negative. Either the circulating antitoxin of these individuals has fallen to a low level, or the infecting dose of organisms has been large or of unusual virulence—usually gravis or intermediate. We ourselves have reported isolated cases and also some outbreaks in Schick-negative reactors (O'Brien, Okell, and Parish 1929, Parish and Wright 1935); the illnesses were usually mild, and in no instance was there a severe attack.

Glenny, Maizells, and Okell, quoted by Okell (1932), found that, of 35 Schick-negative infants between the ages of 3 weeks and 6 months, 29 had less than 0·002 unit of antitoxin per c.cm. of blood and 21 had 0·001 unit or less. Negative Schick tests may thus be correlated in infants with an absence of circulating antitoxin. It will be remembered that Jensen (1931) recorded similar findings in older subjects. Dudley, May, and O'Flynn (1934) have raised the important academic point whether the tolerance of the skin of such subjects to Schick toxin

may not be part of a general "natural" immunity in contradistinction to acquired antitoxic immunity.

Antitoxic immunity against diphtheria has to be considered quantitatively. Thus, one may find at one end of the scale of "immune" individuals a state of active immunity without detectable circulating antitoxin; the patient is able to make good the deficiency by producing antibody with extreme rapidity in response to a specific stimulus. The chances of severe diphtheria are small in these individuals. From "no detectable antitoxin" one can trace all degrees of antitoxic immunity to the stage at which there is a tremendous amount of antitoxin in the circulation, which would ensure the neutralisation of large amounts of toxin even when rapidly produced, and prevent clinical manifestations of diphtheria.

Our results confirm Jensen's that the "Schick level" in man shows considerable individual variation, both when routine and "multiple reagents" are used. Thus, we found that persons with only 0·002 to 0·0005 unit of circulating antitoxin per c.cm. might be negative to fourfold toxin, and with only 0·01 to 0·002 unit might be negative to tenfold. The existence of non-specific constituents in the fourfold and particularly the tenfold reagents sometimes made readings very difficult, and produced inconvenience and discomfort in protein-sensitive individuals. The routine use of "multiple reagents" cannot therefore be recommended until diphtheria toxin in purer form becomes available for Schick tests.

The dramatic reduction of diphtheria in many immunisation campaigns, where the susceptible child population has been made Schick-negative, shows clearly that negative readings imply a reasonably safe "level of immunity." Nevertheless, cases of diphtheria—administratively troublesome though generally mild—occur from time to time in immunised communities. A safe working rule would therefore appear to be the administration of periodic injections of diphtheria prophylactic to all persons, irrespective of their Schick reaction. Thus, children who have been immunised in infancy with two doses of A.P.T., at an interval of two to three weeks, might receive a third injection of prophylactic at the time of entry into school, and, if experience proved it necessary, a further injection at the age of 9 years. Nurses who have been found to be Schick-negative at the time of entry to hospital might be given one injection of a suitable prophylactic. All subjects showing a Schick-positive or doubtful reaction should, of course, receive the full immunising course. Periodic reinjections maintain a higher level of circulating antitoxin and a more durable immunity to clinical diphtheria than a single course of injections. The recent work of Jensen (1937) on nasal immunisation with toxoid suggests a possible alternative method of maintaining circulating antitoxin at a level sufficiently high to ensure safety.

SUMMARY

1. We have confirmed the observations of Jensen and others that there does not exist a fixed antitoxin titre (the "Schick level") above which individuals are Schick-negative and below which they are Schick-positive. Nevertheless, as is shown clearly in Tables I–IV, there is a much higher level of circulating antitoxin in groups of Schick-negative than in groups of Schick-positive people.

2. 114 persons undergoing a course of immunisation, many of whom were expected to have "borderline" immunity, were Schick-tested with the Schick reagents in routine use in this country. Blood samples were taken *immediately before* the Schick test, and revealed a wide zone of circulating antitoxin values corresponding to positive, negative, and doubtful Schick reactions.

3. Similar tests were made with "multiple Schick toxins," 61 persons being tested with fourfold and 39 with tenfold reagents. Negative reactions to the fourfold reagents were obtained in persons with as little antitoxin as 0·002 to 0·0005 unit and to tenfold with as little as 0·01 to 0·002 unit per c.cm.

4. Pseudo-reactions with fourfold and especially with tenfold reagents tended to make readings difficult and to produce discomfort in protein-sensitive individuals. The routine use of these preparations cannot therefore be recommended.

5. The potential immunity is discussed of individuals with little circulating antitoxin but a negative Schick reaction.

6. The Schick test has been of proved value in many immunisation campaigns, but a negative reaction may not indicate in all cases a state of immunity sufficient to withstand attack by virulent gravis or intermediate strains. To maintain a sufficiently high "level of immunity," the periodic injection of prophylactic into Schick-negative as well as positive reactors may be considered advisable.

We are indebted to our colleague, Mr. Glenny, for his valuable help and criticism at various stages of this work, for preparing and standardising routine and experimental toxins for Schick tests, and for carrying out all the blood titrations.

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SULPHANILAMIDE IN THE TREATMENT OF CHANCROID

By H. M. Hanschell, D.S.C., M.R.C.S. Eng., D.T.M. & H.

HON. MEDICAL SUPERINTENDENT, ALBERT DOCK HOSPITAL; HON. ASSOCIATE PHYSICIAN, HOSPITAL FOR TROPICAL DISEASES (SEAMEN'S HOSPITAL SOCIETY, LONDON)

Chancroid has no mortality, no chronic invalidism, and confers no protection against getting it again. It is often accompanied by gonorrhœa or syphilis—sometimes by both. It is a tedious, trivial affliction of high nuisance rank—highest when with bubo. In medicine it is of interest only because of the shadow of muddled diagnosis which falls on it from the chancre of syphilis, and is still reflected in its name. "Soft sore" must be as chilling to the

folk mind as "chancroid," for it is uncelebrated in the English ribaldry and bawdy.

Its endemic areas are seaports, its reservoir the cheapest—in our scale of values the lowest—prostitutes. Even among the venereal diseases it is wholly without dignity. It may soon, however, gain an increase in epidemiological interest, for our modern polity has seen the reappearance of the peripatetic whore. She is the lorry girl: and already the lorry driver with chancroid "picked up on the road" appears in the V.D. clinic.

In the last nineteen years over 700 male cases of chancroid, with or without bubo, have been under my care at the Albert Dock Hospital. Though some were infected in the neighbourhood, the great majority—seafarers of almost every race and colour—have acquired the infection abroad, mostly in tropical or subtropical ports, and all (from whom histories could be got) from prostitutes.

PREVIOUS MEANS OF TREATMENT

A survey of these cases shows that length of time, tedium, and nuisance of treatment is much mitigated if the chancroid ulcer be on the scrotum, on shaft of penis, on outside of prepuce, or (in the circumcised only) on the free surface of the glans. Buboes are then comparatively rare, added streptococcal infection very rare, and the ulcer itself not too long a-healing.

With the chancroid ulcer under a prepuce the nuisance is unmitigated. Buboes are frequent and so is the streptococcal infection. Conservation of prepuce meant more often and longer in-patient, and longer out-patient, treatment. The "best" chancroid ulcer openly faces the outside world: for even the diminutive one tucked away almost out of sight in the recess of the lateral fold of frenum and ventral surface of glans in the circumcised is just as often linked with bubo, and devours as much time and trouble as a like chancroid in the same site in the uncircumcised.

There is a traditional exercise of clinical observation and discussion, in an obvious, if limited field, by "the watch below"; and the fo'c'sle has a well-founded knowledge, sympathetically shared ("You know, doctor"), that this subfrenal chancroid has ended or will end in "carrying away the bobstay."

Prepuce and frenum were bars to recovery. Lateral slits, or one mid-dorsal slit, of the prepuce, meant in my hands—whatever the precaution to stave it off—chancroid infection of the cut surfaces of the slit: and equally circumcision, and extirpation of the frenum, meant circumferential and frenal area chancroid. But the circumferential, and frenal area, chancroid thus induced did not take longer to heal than the "slit" chancroids; and nearly all the owners of "slits" eventually, and ruefully, demanded trimming of the preputial flaps.

Both groups were, however, sooner discharged from treatment than if neither slit nor circumcision had been performed. And in all frenal chancroids extirpation of frenum hastened recovery. Furthermore, none I circumcised developed bubo, though some, of course, had bubo to start with. Some of the merely slit did; but so did many more of those whose prepuces were left uncut!

All drugs were ineffective; and so was intravenous protein "shock." Dmelco's vaccine was ineffective too, even as intravenous "shock." The patients, however, liked the extra attention—"the magic of injection." Powders and paints of all colours applied to the ulcers were equally ineffective; all antiseptics equally useless. Diathermic necrosis of ulcer meant a much larger ulcer, and bubo for sure to follow. Prolonged washing of ulcer was a definite help; it enforced an easy access to the ulcer surface, and reinforced the decision not to conserve either prepuce or frenum. So, after years of changes, chops, and comparisons, rules formed themselves:—

1. The chancroid must face openly the outside world.

2. Buboes, if fluctuation is present, must be aspirated, repeatedly if necessary, with all aseptic care: never incised.

3. The chancroid must be washed thoroughly and for long, and every day.

1 2

FIG. 1.—Indian seaman (Mohammedan). Chancroid on shaft of penis three weeks after infecting coitus at Bombay. No bubo.
FIG. 2.—The same after nine days' treatment with prontosil.

Therefore for the last nine years (370 cases to date) circumcision (one mid-ventral and one mid-dorsal suture) has been done for every ulcer under the prepuce, together with extirpation of frenum—as soon as may be, and in fact, in the majority, at once. Operation was always carried out under local anæsthesia, the anæsthetic drug being injected deep-subcutaneously around the root of penis so as to lie on the fascia covering cavernosa and spongiosum. For the last two years Proctocain has been used; its prolonged analgesia makes it ideal for this operation.

In addition at least one hour's immersion of the ulcer in coloured water in a wide-mouthed jar has been required of every patient every day. This immersion ritual gives him a much-needed something to do—for himself. The water from the hot tap in the clinic, when lightly tinted with pot. permang. acriflavine, or methylene-blue, interests him; gives him a ring of colour changes; often provides satisfaction for fancy, and, since "sea lawyers" are many, something to argue about as to merits with his clinic mate (equally afflicted but of a different fancy); keeps him happy, and the ulcer immersed. Under these disciplines chancroid required a few to, sometimes, many weeks' care, even if bubo were absent.

RESULTS WITH SULPHANILAMIDE

Against this I now put forward my experience with the last 20 cases. These have all been treated with sulphanilamide. Each case received at once 5 c.cm. of 5 per cent. Prontosil soluble (Bayer) injected deep-subcutaneously over the gluteus medius: and one or two further injections, at three-day intervals, of 10 c.cm., and in addition Prontosil album (Bayer) by mouth in divided doses, 3 grammes in 24 hours. There has been rapid healing of ulcer without leaving the old, unmistakable, oft-embarrassing, precipitous-edge scar; and rapid subsidence of bubo in 5–10 days. The impressive surprise came with the first two of these cases, both with large frenal ulcers. After circumcision and extirpation of frenum there was never a sign of chancroid infection of the cut surfaces. The accompanying photographs of two typical cases, before and after treatment,

3 4

FIG. 3.—European seaman. Frenal chancroid and bubo three weeks after infecting coitus at Valencia. Photograph taken 48 hours after circumcision and start of prontosil treatment.

FIG. 4.—The same after ten days' prontosil treatment. First-intention healing of wound; chancroid healed without precipitous-edge scar

illustrate well the effect of prontosil (Figs. 1–4). In the last 12 cases, "immersion" has been dispensed with: the ulcer was covered at once with Elastoplast strip and left undisturbed for days. When circumcision was performed, the wound has been closely sutured, covered with elastoplast and left undisturbed for 6–8 days. First-intention healing has been the rule. The raw site left by extirpation of frenum has not become chancroid-infected—even from a frenal chancroid—and has healed rapidly. Not even the still live memory of past times can now make us look on a chancroid as a nuisance: it has joined the chancre to be a relief break in the procession of gonorrhœa.

Throughout the whole period, the daily care and dressing of these lesions—and what is more difficult and more important the management of the case, as a man and a patient—has been ably and critically performed by Mr. J. Lowton; the idea, development, and perfection of the effective immersion technique has been his and it will still be required on occasion. The pathological investigations have been carried out by Mr. A. H. Walters; and for their watchfulness of the cases, and for their assistance, I am much indebted.

THE EFFECT OF ANTITHYROTROPIC SERUM ON THE ACTION OF HUMAN THYROTROPIC HORMONE

BY CUTHBERT LESLIE COPE, D.M. Oxon., M.R.C.P. Lond.

ASSISTANT TO THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL, LONDON

IT is well known that the anterior lobe of the pituitary gland contains a substance which, when injected into suitable animals, stimulates the thyroid gland. This substance, named the thyrotropic hormone, produces all the usual manifestations of hyperthyroidism, together with enlargement of the thyroid gland and, under certain conditions, even exophthalmos. The clinical condition of the injected animals is closely similar to human Graves's disease. But as yet no definite evidence has been obtained that the thyrotropic hormone is formed in excessive amount in this disorder; indeed, the evidence so far available points to a diminished, rather than an increased, amount of it in the circulating blood (Cope 1938). This evidence, however, can scarcely be regarded as conclusive, and the possibility remains that this thyroid-stimulating hormone is indeed concerned in the production of the hyperthyroidism of Graves's disease.

Now it was shown as long ago as 1934 by Collip and Anderson that if injection of thyrotropic hormone into an animal be continued for several weeks a state of resistance is gradually set up, so that the thyroid gland of this animal ceases to respond to the stimulus. The sequence is shown particularly well

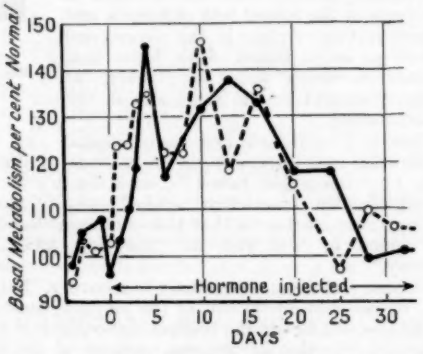

FIG. 1.—Development of immunity to thyrotropic hormone by guinea-pigs.

in the metabolic rate. Under the influence of the thyrotropic hormone this rises rapidly to 30–40 per cent. above the normal. But continued injection will not maintain the metabolism at this high level. After about a fortnight it begins to fall and in 3–5 weeks it is again normal. The thyrotropic hormone no longer influences the thyroid gland and the animal has become resistant. I have been able readily to confirm this observation of Collip and Fig. 1 shows well the development of such a refractory state in two guinea-pigs treated in this manner. Collip was further able to show that if the serum from such a refractory animal was injected into a normal guinea-

pig, then the latter acquired a passive immunity to the thyrotropic hormone. The serum of the resistant animal possessed strongly antithyrotropic properties.

This fact has been confirmed by numerous observers (Scowen and Spence 1936, Rowlands and Parkes 1936) and is of considerable importance. For clearly, if Graves's disease is due to an excessive production of thyrotropic hormone, the injection of a serum having strongly antithyrotropic properties might be expected to produce a marked diminution in the symptoms of hyperthyroidism and hence to be a valuable method of treatment. It may seem surprising, therefore, that although several workers have produced actively antithyrotropic serum in considerable quantity, yet no reports of its beneficial use in cases of Graves's disease have, so far as I am aware, been published.

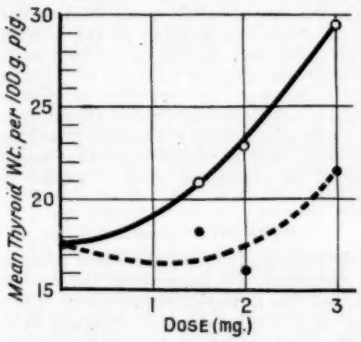

FIG. 2.—Showing the inhibition of the action of ox thyrotropic hormone by specific antiserum. In Figs. 2 and 3 circles = hormone alone; discs = hormone and antiserum.

But it has become apparent in the last few years that these antisera may show a specificity of greater or less degree. Most work in this field has been carried out with gonad-stimulating hormones, and it has been found that sera rendered antagonistic to the gonadotropic hormone from the pituitary gland of one species of animal may not inhibit the equivalent hormone similarly prepared from a different species. Much work on this point has been carried out by Rowlands (1938) who also gives a good survey of the relevant literature.

In view of this species specificity, it seemed desirable to determine whether serum rendered antagonistic to thyrotropic hormone derived from ox pituitaries (the most readily available source) would inhibit the action of human thyrotropic hormone. For if it did not, it was unlikely to prove of therapeutic value in the human subject.

Although most work on the specificity of antihormone sera has been carried out with the gonad-stimulating group, a certain amount has also been done with antithyrotropic serum. The results, however, are somewhat conflicting. Thompson (1936) prepared in a dog an antiserum to sheep-pituitary thyrotropic hormone and found this serum capable of inactivating not only sheep but also bovine thyrotropic hormone. He also claimed that the antiserum inactivated a thyrotropic extract of the urine of human myxœdema, but his results supporting this claim are not very convincing. His serum thus appeared to be non-specific. But Eichbaum, Kindermann, Oestreicher, and Reiss (1937) found that animals made immune to an ox thyrotropic preparation are still capable of undergoing thyroid stimulation by thyrotropic extracts derived from the pig, a result which indicates that the antiserum developed in these animals to ox thyrotropic hormone is incapable of inhibiting the equivalent hormone from the pig.

Apart from the somewhat indecisive result of Thompson, no published report of the effect of such antisera on thyrotropic hormone of human origin seems to have appeared.

THE PRESENT OBSERVATIONS

It has already been found possible to obtain thyrotropic hormone from the human pituitary gland, though the yield is relatively smaller than from the ox pituitary (Cope 1938). For the present experiments human pituitary glands were collected from routine post-mortems and were desiccated in acetone. Over a period of six months 50 glands were obtained with a total dry weight of 4·2 grammes. The glands were finely shredded and extracted for 24 hours with 50 per cent. aqueous pyridine. The active principle was recovered by pouring this extract into a mixture of four volumes of alcohol and one volume of ether, the method being that originally used by Rowlands and Parkes (1934). The total yield of dry powder was 700 mg. This powder had only about 30 per cent. of the thyrotropic activity of a similar preparation from ox pituitaries: 12 mg. was equivalent to one Parkes unit—that is, it required the injection of 12 mg. daily for five days to increase the thyroid weight of a 180 g. guinea-pig to 60 mg.

The antithyrotropic serum was prepared in a pair of rabbits by the daily injection of 25 mg. of an extract of ox pituitaries rich in thyrotropic activity. This extract was made from an "undegreased anterior pituitary powder" kindly supplied by Messrs. Armour and Co. Injection was continued for four months, during the last six weeks of which the serum was strongly antithyrotropic and was removed at intervals by bleeding from an ear vein. The effect of this serum on the activity of the original ox thyrotropic hormone is shown in Fig. 2. In this Figure each point represents the mean thyroid weight of a group of 4–6 guinea-pigs. The members of each group were so chosen that all possible error due to variation in the potency of different samples of antiserum was eliminated.

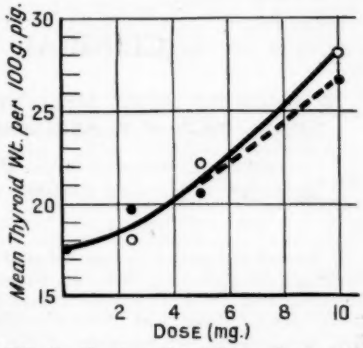

FIG. 3.—Showing the failure of an antiserum to ox thyrotropic hormone to inhibit the action of human thyrotropic hormone.

In the upper curve (circles) the effect of increasing doses of ox thyrotropic hormone on guinea-pig thyroid weight is well shown. Each guinea-pig received the charted dose of hormone subcutaneously for five days and was killed on the sixth. In the lower curve (black discs) is shown the thyroid weights of a second batch of guinea-pigs treated in a precisely similar manner, save that each received in addition 1·5 c.cm. of antiserum injected daily. To avoid in-vitro mixing, the hormone and the antiserum were injected separately at different sites. It will be seen that this dose of the antiserum completely inhibited 2 mg. of the thyrotropic powder, and that 3 mg. produced a thyroid weight of only 21·5 mg. per 100 g. guinea-pig, although in the absence of this

serum the same quantity of hormone gave a thyroid weight of 29·5 mg. per 100 g. guinea-pig.

The same effect is shown also in the histological appearance of the gland. The unantagonised action of the hormone leads to epithelial hyperplasia and loss of colloid from the thyroid vesicles. The antiserum inhibits not only the weight increase but also the histological changes, the epithelium remaining in the flat or resting state and the colloid persisting unchanged in the vesicles.

In Fig. 3 the same experiment has been repeated using human thyrotropic hormone (circles). Owing to its potency being weaker than that of the ox hormone, larger quantities had to be given to produce a comparable curve. In this Figure the lower curve (black discs) indicates the result of attempting to inhibit the action of the human thyrotropic hormone with the same serum which, in Fig. 2, was shown to inhibit the action of thyrotropic hormone from ox pituitaries. In this curve also 1·5 c.cm. of serum was given on each of the five injection days and here too each point represents a group of five animals. It will be readily seen that this serum inhibits only very slightly the action of the human hormone. With the smaller hormone doses the inhibition is not detectable. With the largest the thyroid weight is reduced only from 28 mg. to 26·5 mg. per 100 g. guinea-pig.

The same result is also indicated by the histological picture. This antiserum had no appreciable ability to inhibit the epithelial hyperplasia and colloid lysis produced by the human thyrotropic hormone.

The effect of this serum on human hormone is thus in marked contrast to its effect on the same hormone derived from the ox.

It is clear that an antithyrotropic serum prepared in the rabbit against ox pituitary shows a species specificity and is practically inactive against the human thyrotropic hormone. It is unlikely that the production of antiserum in an animal other than the rabbit would overcome this species specificity. There is every reason to expect that human thyrotropic serum injected into a rabbit would lead to the development of a serum antagonistic to the human hormone, but we have been unable to produce such a serum because of the limited supplies of human pituitary glands available. The number of glands required to produce sufficient anti-human thyrotropic serum for therapeutic trial in man is a serious handicap to work in this field, and it would seem that some alternative method of producing such a serum is badly needed.

SUMMARY

Antithyrotropic serum, prepared in rabbits against ox thyrotropic hormone, will antagonise the action of this hormone, but has a negligible inhibitory effect on the action of thyrotropic hormone obtained in a similar manner from human pituitary glands.

Owing to this species specificity it seems unlikely that such serum will prove of therapeutic value in the human subject.

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CLINICAL AND LABORATORY NOTES

A POSSIBLE CASE OF LOW RENAL THRESHOLD FOR ASCORBIC ACID

BY C. A. MAWSON, M.Sc., Ph.D.

BIOCHEMIST TO THE ROYAL BERKSHIRE HOSPITAL, READING

A WOMAN patient, who was referred to the Royal Berkshire Hospital by Dr. J. Anderson Hill of Mortimer and Mr. J. B. Parfitt, complained of feeling "run down." She had hæmorrhagic gums with free blood along the margins. Films from a swab of the gums did not show any significant infection, and there was no traumatic injury. The condition had been present for over two years, varying in severity with general conditions of health and becoming much worse during a pregnancy. No other abnormality was found.

INVESTIGATION

Scurvy was suspected, but the patient's diet was stated to contain fresh fruit considerably in excess of normal and the urine contained 3·82 mg. of ascorbic acid per 100 c.cm. The plasma ascorbic acid was, however, only 0·76 mg. per 100 c.cm. which is only about 60 per cent. of that given by Deggeller (1936) and van Eekelen (1936) as the criterion of saturation. Since the diet and urinary excretion suggested that she should have been saturated with respect to vitamin C, an ascorbic-acid saturation test was performed. This was done according to the procedure of Harris and Abassy (1937) and the results are given in the Table.

The preliminary test of basal ascorbic-acid excretion gave a figure of 39·6 mg. per 24 hours, which satisfied the criterion for saturation of Harris and Ray (1935) (20–30 mg.) and of Ahmad (1936) (23–35 mg.) In the second part of the test the bladder was emptied at 9 A.M. and a blood sample taken at 10 A.M. The plasma ascorbic acid at that time

ASCORBIC-ACID SATURATION TEST

Time.	Period of urine secretion (hours).	Urine ascorbic acid.		Plasma ascorbic acid (mg. per 100 c.cm.).
		mg. per 100 c.cm.	Total in period, mg.	
10 A.M. ..	—	—	—	0·50
	Patient received 600 mg. of ascorbic acid at 10 A.M.			
12 noon ..	3	32·0	33·5	1·65
2 P.M. ..	2	83·6	51·8	—
3 P.M. ..	1	34·3	17·2	—
4 P.M. ..	1	21·9	8·3	—
5 P.M. ..	1	15·5	5·6	1·16

was 0·50 mg. per 100 c.cm. The patient was then given 600 mg. of ascorbic acid in 50 c.cm. of 0·6 per cent. sodium bicarbonate solution. Complete urine samples were obtained at intervals up to 5 P.M. and blood samples at noon and 5 P.M. These were analysed immediately, using an equal quantity of 10 per cent. trichloracetic acid containing 2 per cent. metaphosphoric acid (Fujita and Iwatake 1935) as deproteinising agent and titrating rapidly with 0·01 per cent. 2–6-dichlorophenolindophenol.

Johnson and Zilva (1934) state in the original paper on ascorbic acid saturation tests that the

maximum rate of excretion of the vitamin invariably occurs in the fourth hour, and Harris and Abassy (1937) say that little excretion occurs during the first three hours, and it then rises to a maximum in the second three hours. Our patient excreted about 51 per cent. of the total amount in the first three-hour period and only 44 per cent. in the second three hours. At the peak of excretion the plasma ascorbic acid was only 1·65 mg. per 100 c.cm. falling five hours later to 1·15 mg. per 100 c.cm. There is no adequate standard of ascorbic-acid tolerance in saturated individuals but it seemed significant that our patient, living on a diet of very high ascorbic-acid content and having an excretion-rate typical of complete saturation, should show a maximum plasma ascorbic acid, after a dose of 600 mg. of the vitamin, which lies within the normal limits (up to 1·7 mg. per 100 c.cm.) of persons who have received no additional ascorbic acid.

These considerations led us to a tentative diagnosis of "renal scurvy," for we thought it possible that the low plasma ascorbic-acid level was due to an abnormally rapid rate of excretion of the vitamin by the kidney. This hypothesis was supported by the statement by Deggeller (1936) that the renal threshold of ascorbic acid is 0·9–1·5 mg. per 100 c.cm. of plasma, and by that of Faulkner and Taylor (1938) who put the normal renal threshold at about 1·4 mg. of ascorbic acid per 100 c.cm. of serum. This patient excreted a normal amount of ascorbic acid with only 0·50–0·76 mg. per 100 c.cm. of plasma.

She was given 500 mg. of ascorbic acid per day for 12 days. After an interval of 27 hours without any additional vitamin a three-hour urine sample (116 c.cm.) contained 33·8 mg. of ascorbic acid (270 mg. per 24 hours), and the plasma ascorbic acid was 1·44 mg. per 100 c.cm. The condition of the gums had greatly improved, one side of the mouth being completely healed and two or three small red patches remaining on the other side. No free blood was detectable. She felt much better in general health. After one more dose of 500 mg. of ascorbic acid the dose was omitted for two days. At 5 P.M. on the third day the urine ascorbic acid was 11·2 mg. per 100 c.cm., showing that even after 2 days without vitamin the excretion was still very high. The gums were now almost completely healed, with no free blood and only one small red patch over a central incisor.

Unfortunately at this point the patient had to leave the country, so we were unable to make the crucial test of observing the effect of withdrawal of additional ascorbic acid. However her health had improved to such an extent that she wished to continue treatment and she was supplied with 500 tablets of ascorbic acid (Roche) containing 50 mg. per tablet, and told to take 4 tablets daily for a month and 2 tablets daily thereafter. It was hoped by this means to keep the plasma ascorbic acid above 1·0 mg. per 100 c.cm., which is described by Deggeller (1936) as the minimum satisfactory concentration.

SUMMARY

1. A case is reported in which a patient on an adequate diet had a subnormal plasma ascorbic acid together with a normal rate of excretion in the urine.

2. The patient felt unwell and had hæmorrhagic gums of more than two years' standing.

3. A saturation test with 600 mg. of ascorbic acid raised the plasma ascorbic acid to within normal limits, while the greatly increased excretion in the urine occurred more rapidly and at a lower plasma concentration than would have been expected in a normal person.

4. Dosage with 500 mg. of ascorbic acid for 12 days raised the plasma ascorbic acid to normal and led to an almost complete cure of the condition of the gums.

5. It is suggested that the condition of the patient might be due to an abnormally low renal threshold for ascorbic acid.

My thanks are due to Dr. J. Mills, who first drew my attention to the possibilities of this case, for his help and criticism. A detailed account will appear in the Royal Berkshire Hospital Reports (1936–37).

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A DIAGNOSTIC SIGN FOR RETROCÆCAL APPENDICITIS

BY EMIL ALTSCHÜLER, M.D. Strasbourg

SURGEON IN TEL-AVIV; FORMERLY SURGEON-IN-CHIEF OF THE ISRAELITISCHES KRANKENHAUS, FRANKFORT-ON-MAINE

IT is important for the clinician to know the anatomical variations in the position of the appendix. In some cases a correct diagnosis depends on this knowledge, and the course of appendicitis is influenced by the relationship of the appendix to the neighbouring organs. The varied symptom-complex in the disease is surely due to the great diversity in the location of the appendix, and it is very important to be clear about this.

The position of the appendix is expressed in relation to the cæcum. Most often it arises from the posteromedial side, at the junction of the tæniæ, and hangs freely in the peritoneal cavity. This is the pelvic position of the anatomists, and occurs in 37 per cent. of the cases. Next to this the chief positions are: (1) the ileocæcal, in which the appendix is located in the inferior ileocæcal corner behind the point of entry of the ileum into the cæcum (12 per cent.); and (2) the laterocæcal, in which the appendix encircles the cæcum in front or lies entwined around the ampulla and under it (10 per cent.). Beside these three main positions, which comprise 59 per cent., there are a series of other normal positions, the principal being the retrocæcal.

These figures are taken from a detailed anatomical investigation suggested by Waldeyer and carried out by Liertz (1909) in the anatomical institute of the University of Berlin. The position of the appendix was studied in 2092 cases.

My extensive experience has made it possible for me to study one section of the wide and varied field of appendicitis. These are the cases of appendicitis in which the cæcum lies on the appendix near the posterior wall of the peritoneal cavity—chiefly those in the retrocæcal and ileocæcal positions of the anatomists. From the clinical standpoint they can all be included under the term retrocæcal appendix.

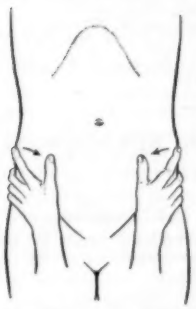
This anatomical position and resulting relationship to neighbouring organs produce a symptom-complex that can easily be recognised by one definite sign, which I shall describe below. The course of the illness is usually not so characteristic.

From my experience I find that disease is more frequent in the retrocæcal appendix than in any other

type. I cannot say whether this is because appendices in this location are more prone to inflammation or whether the position depends on racial characteristics —my material was very one-sided, comprising mostly Jews. Of the neighbouring organs the posterior peritoneum that covers the iliac, psoas, and quadratus lumborum muscles are affected first. Next in order come the ureter and especially the ileolumbar vein. The latter is of particular importance in certain complications (Altschüler 1938).

THE SIGN

As in other forms of appendicitis, generalised abdominal pain, beginning acutely often in the region of the stomach, is the chief symptom. Examination reveals a distended abdomen, no muscle spasm, none of the familiar points of tenderness. Only on very deep pressure over McBurney's point will there be slight tenderness in severe cases. In most of these a diagnosis cannot be made at first.



Method of examination.

In all cases, however, I have found one sign absolutely reliable—decided tenderness and definite circumscribed muscle spasm localised over the right pelvic margin.

The third, fourth, and little fingers of the left hand are laid on the outer border of the ilium and the left index-finger on the inner border. If the index-finger is very gradually moved over the soft parts from the anterior superior spine downwards, every case of retrocæcal appendicitis shows a definite, often very painful sensitivity, usually restricted to a small area. In severe cases there is also very definite localised muscle spasm in the same place, sometimes higher, sometimes lower. The abdomen is usually not sensitive to pressure and the usual points of tenderness are absent.

The contrast is particularly striking when the left side is examined in the same manner and not the slightest tenderness is elicited. I have not been able to find this observation described in any of the literature.

The cases with an acute and severe onset that are not diagnosed and not operated on generally lead to retrocæcal and retroperitoneal pus formation. The peculiar thing is that the abscesses often develop without much pain or high temperature, the symptoms being limited simply to generalised abdominal discomfort. The diagnosis of these abscesses is often very difficult, especially when they are not very large. In these cases also the sign described above is an important diagnostic aid.

Diagnosis of the subacute and chronic cases is even more difficult without the aid of my diagnostic sign.

I have seen patients who were treated for a long time as sciatica. I recall two patients who for years suffered from continuous slight elevations of temperature, colicky pains in the region of the large intestine, and diarrhœa, who had been under the observation of reputable physicians and treated as colitis. By means of my sign I recognised these cases as appendicitis, operated, and cured them. Beside these chronic intestinal affections, I saw chronic unilateral kidney affections caused by a chronically diseased retrocæcal appendix. In this class belong also those cases of constant abdominal discomfort with constipation and diarrhœa.

Carefully executed X ray examination is a great help in diagnosis. Oppenheimer (1931) has described the procedure. Notice should be paid to motility, peristalsis, content of mucus, retention, points of tenderness, and functional relationship of the appendix to the ileum and cæcum. In recent years I have had such an X ray examination carried out in almost all the cases and always found it to correspond to my clinical findings.

SUMMARY

A sign is described that is of considerable value in the diagnosis of retrocæcal appendicitis, when the classical signs are absent. Circumscribed tenderness and muscle spasm are found on palpating the right pelvic margin.

The sign is especially useful in the following types of cases: (1) acute retrocæcal appendicitis before tenderness has appeared in the usual position; (2) small chronic almost symptomless abscess after retrocæcal appendicitis without operation; (3) long-standing chronic retrocæcal appendicitis generally diagnosed as colitis. In the chronic cases careful radiography is an additional aid to diagnosis.

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REPORTS AND ANALYSES

ERGO HEALTH BREAD

(POLLEY AND CO., LTD., 44/54, PLYMOUTH-ROAD, LONDON, E.16)

WE have received for analysis a further sample of this bread which is recommended by its makers in cases of diabetes, obesity, and digestive troubles. The loaves weigh 1 oz. each, are bulky in size, attractive in appearance, of even texture, and pleasant flavour. When analysed the following results were obtained :—

	Per cent.
Water	6·74
Ash	0·90
Protein	42·00
Fat	1·10
Crude fibre	0·16
Carbohydrate (altered starch) ..	49·10

Some of these percentages differ from those published after a previous analysis, but the difference is attributable to an error in the figure given for crude fibre. The calorie value of this bread works out at 1774 per lb.; an average figure for the calorie value of white bread is 996. A bread with so high a protein content and possessing nearly twice the calorie value of ordinary bread should be of service to the dietitian.

ROYAL SANITARY INSTITUTE.—The planning of hospitals will be discussed at a meeting of this institute to be held at the new Perivale Maternity Hospital, Western-avenue, Ealing, on Thursday, April 21st, at 2.30 P.M. The discussion will be opened by Mr. L. G. Pearson, F.R.I.B.A., Dr. James Ferguson, medical officer of health for Surrey, and Dr. Thomas Orr, medical officer of health for Ealing. The chair will be taken by Prof. J. M. Munro Kerr. Before the meeting, at 11.30 A.M., an inspection will be made of the hospital.

MEDICAL SOCIETIES

WEST KENT MEDICO-CHIRURGICAL SOCIETY

A MEETING of this society held at the Miller General Hospital on April 8th, with Dr. H. BOWEN WILLIAMS, the president, in the chair, debated the question That all confinements are best conducted in a midwifery institution.

Confinements at an Institution

Mr. M. P. REDDINGTON, proposing the motion, said that in general he was strongly opposed to the trend of modern medicine towards the establishment of institutions, and to the growing restrictions on private medical practice. The general practitioner must, however, assess his limitations of environment and equipment. One argument in favour of sending the expectant mother to an institution arose out of the fantastic publicity which had been given to the figures for maternal mortality; these had caused an immense amount of harm. Many women were now convinced that a confinement meant a descent into the valley of death. Primary uterine inertia was solely due to this fear in the patient's mind, and to this negative psychological outlook the hospital was an antidote, with its appearance of efficiency and good equipment. There was little doubt that obstetrical emergencies ought to be dealt with in institutions. The toxæmic emergency could not be effectively dealt with in the home. The present method of handling disproportion was to give the patient a trial labour, and as a Cæsarean section might be necessary, the confinement had to take place in an institution. Hæmorrhage also needed the equipment for transfusion and intravenous saline which only an institution could provide. It was also more convenient for the patient to leave her home, where two or three children might be screaming round the house and tradesmen's boys constantly ringing the bell. A much greater factor in favour of the institution was post-puerperal morbidity. Every operation sheet of every London hospital contained at least one operation for prolapse or retroversion. The sequelæ of a confinement could not be properly conducted in the patient's own home. Prolapse was almost inevitable if a woman had to get up after ten days and do her housework, but if she were kept in an institution for a fortnight she was ready to resume her household duties. This argument, of course, applied only to the hospital class of patient. Institutional confinement was also better from the doctor's point of view, for he need not work under the handicaps imposed by the patient's relatives. Moreover, general practice was not the right place for obstetrical work, for a busy practitioner could not give the necessary time and attention to it. His surgery and visits were bound to conflict with confinements. Although he lost touch with his patient during the short time she was in the institution, she would return very glad to be treated as a person instead of as a number. The doctor, on the other hand, was delighted to welcome her back, and to treat the baby for marasmus or anything else that might be necessary.

Mr. J. B. BLAIKLEY, seconding the motion, admitted that experience had shown that straightforward confinements could usually be safely carried through in the home. Nevertheless, every doctor who did much midwifery was only too well aware that emergency might arise suddenly and without warning —e.g., severe post-partum hæmorrhage or a prolapse of the cord—and need institutional treatment. Two or more workers were often needed to carry out rapid treatment, and the mother and child might have to be treated at the same time. A long labour was much easier to manage for an obstetrician who was resident or semi-resident than for a busy general practitioner. The risk of septic infection had in the past been a drawback of the institution, but nowadays, with increased knowledge of puerperal fever and allied infections, the risk was no greater than in the home. The statistics of at least one hospital showed that the incidence of infection by *Streptococcus hæmolyticus* group A was greater on the district than in the wards. Greater precautions must, of course, be taken in an institution to obviate the carriage of infection, but the institutional practitioner was less likely than the general practitioner to come into contact with whitlows or streptococcal sore-throats. In an institution the midwives and nurses were supervised by a competent matron. Many general practitioners did midwifery nowadays only through the compulsion of competitive practice, because if they refused a confinement the woman would go to a rival and her whole family would follow her. Most doctors would probably be glad if midwifery disappeared altogether from general practice.

Confinements at Home

Dr. T. F. MEYRICK, who moved the rejection of the motion, remarked that the two openers seemed to think institutionally and never to have gone out into general practice. Sixty per cent. of all pregnancies were normal, and child-bearing had been domiciliary throughout all human generations. The maternal mortality figures had gone up from 3·74 to 4·1 per thousand in the last thirty years, the very period during which institutional treatment had been growing so rapidly. Officialdom had paid a wholly disproportionate attention to the four women in every thousand who died, and had neglected the vast majority who lived. The mortality figures in the overcrowded areas of London were lower than in less populous areas. Sixteen per cent. of maternal deaths were due to cases of abortion, but they did not include those who had been attended and had lived. The maternity home nowadays sent abnormal cases to hospital just as the general practitioner had previously done. The ordinary patient had great confidence in her general practitioner, and connected the idea of the institution with that of disease. She thus came to look on pregnancy as an illness. In an institution she was passed from one person to another and did not find that she received the same attention as her doctor would have given her. Women were probably immune to the infection latent in their own homes, and no precaution would prevent streptococcal infection in a ward. Many women were discharged from institutions after 10 days or a fortnight still losing blood. Institutions often discouraged patients from consulting their general practitioner again, and insisted on their returning for advice. The institution medical officer, being an obstetrician, was tempted to use surgery on insufficient grounds and to prefer a Cæsarean section to a trial labour. Institutions were also too fond of interference such as radioscopic examination with an injection of lipiodol into the sac. Half-humorously, Dr. Meyrick pictured the growth of a mass-produced population the members of which could never say,

with Thomas Hood, "I remember, I remember, the house where I was born."

Dr. F. HUDSON EVANS, seconding the rejection, complained that the statistics of mortality and morbidity conveyed a wrong impression to the public mind. Only 7·7 per cent. of all deaths in women were due to pregnancy and labour. The married woman was a better risk than the single woman. He was sure that very few of those present had ever had a woman patient die as a direct result of pregnancy or labour. The figures neglected to allow for the general risk; about 11·6 per thousand. He did not think that his own results in 40 years of general midwifery practice showed any reason for the current agitation for institutional treatment. If reasonable cleanliness were observed in the home and nothing allowed to touch the patient unless it was aseptic, and the doctor were free from oral or nasal sepsis, the patient would be safe. The institutional officer sometimes did not live up to the lavish equipment of his hospital. Dr. Evans detected, in the scare-mongering which took place in the press and in Parliament, the work of interested organisers who wished to regiment the people all through their lives with the precision of Chicago pig-killers. It was possible that the registrar-general hid in his bosom the secret that more people died in a year from having their ankles bitten by gnats than from the alleged tragedy of parturition. The organisers had forgotten that the general practitioner had been trained in midwifery and was often quite good at it. Admittedly, those who were not should leave it alone. The municipal councils would do better if, instead of trying to steal the family doctor's midwifery work from him, they would spend some of the money in providing pregnant women with sterile maternity outfits. General practitioners should, however, admit that they ought to manage their confinements better: they should give the same antenatal and postnatal care as the clinics gave. They had an opportunity of doing all these things, because they were the persons to whom the patient first came for an answer to the momentous question—"Is it or is it not?"

DISCUSSION

The PRESIDENT considered that midwifery was better treated in an institution, to avoid conflict with the general practitioner's other commitments and the consequent risk of a hurried application of forceps under an anæsthetic given by the doctor himself.

Mr. H. M. JOSEPH saw the agitation for institutional midwifery as a purely political movement. The patient, especially the poorer patient, much preferred to be confined in her own home, so that she could keep an eye on it and see her friends and her husband every day.

Dr. C. J. B. BUCHAN said that the committee of the British Medical Association which had discussed the provision of midwifery services in London complained that the hospitals took all the cases away from practitioners, and had inquired whether the hospitals could not raise their fees. The answer from at least one hospital had been that they would be willing to pay women to come in. The institutions were therefore in direct competition with the general practitioner.

The meeting rejected the motion by a large majority.

REVIEWS AND NOTICES OF BOOKS

The Public Health Act, 1936

By H. SAMUELS, M.A., of the Middle Temple and Northern Circuit, Barrister-at-Law; and PHILIP FORES, M.A., LL.B., Inner Temple and Lincoln's Inn, Barrister-at-Law. London: Sir Isaac Pitman and Sons. 1938. Pp. 499. 30*s*.

THE experts who lately re-wrote our public health code were successful in introducing greater simplicity, uniformity, and conciseness. Along with their draft Bill they produced a blue-book which clearly explained the proposed changes and the reasons for making them. When the Bill became law the Ministry of Health published its usual expository circulars for the information of local authorities. These official materials furnish the foundation of a text-book. Mr. Samuels and Mr. Fores make full use of them and add, for the benefit of those who were brought up on the Act of 1875, the comparative references from the new law to the old. Part of the apparatus of notes is apt to be mechanical; readers may feel that they do not need to be told after every section that "the Minister" means the Minister of Health; but the authors refrain from dragging in judicial decisions which arose on the old enactments and are irrelevant to the new. They add the subsequent statute about the drainage of trade premises, and they manage to mention the even more recent Factories Act. Future editions will have to print the text not only of the Public Health Act but also of the regulations and orders which flow from it. The orders under Section 314 for amending or repealing local Acts may be hard to trace. The Order in Council under the ingeniously technical provision of Section 346 (2), issued a year ago, deserves mention even if it mainly concerns the metropolis with which the Public Health Act itself, like the volume under review, has not much to do. The book is a careful and adequate guide to a branch of administrative law which many must study.

Feeding Behaviour of Infants

By ARNOLD GESELL, Ph.D., M.D., Sc.D., Professor of Child Hygiene and Director of the Yale Clinic of Child Development, School of Medicine, Yale University; and FRANCES L. ILG, M.D., former Pediatric Research Assistant at the Clinic. London: J. B. Lippincott Co. 1937. Pp. 201. 21*s*.

WE have little but praise for this careful study of the behaviour aspects of infant feeding. Prof. Gesell has made all psychologists his debtors by his pains-taking objective studies, which are a mine of facts, quite apart from their value as illuminations of child behaviour and the child-mind. This book deserves study for the facts alone by the pædiatrician as well as by the psychologist, inasmuch as feeding is not solely an event in alimentary life, but a moment of psychic importance to the child, indicating its intelligent grasp of those externals that satisfy an instinct, and its close emotional interest in the process. It is for this reason that the chapters on the behaviour hygiene of the child and the adult-infant relation are of outstanding importance. Prof. Gesell does not accept the psycho-analytic view of the trauma of weaning, nor does he unreservedly accept the pleasure principle as applied to oral activity. On these points psychopathologists will differ from him, inasmuch as the child in the years that follow infancy

shows many signs of disturbed oral gratification. But objective studies of this kind have an immense value in so far as they put a brake upon over-enthusiastic speculations.

Tropical Dispensary Handbook

Third edition. By CLEMENT C. CHESTERMAN, M.D. Lond., M.R.C.P., D.T.M. & H. Camb., late Physician in Charge, Baptist Mission Hospital, Yakusu, Haut Congo Belge; Membre de la Commission Royale pour la Protection des Indigènes. London: United Society for Christian Literature. 1937. Pp. 299. 7*s*. 6*d*.

THIS book presents the outcome of an endeavour to bring together the outlines of medical knowledge for native medical assistants in rural dispensaries in the tropics.

The four sections deal with medical and surgical diseases, minor surgical procedures, drugs and dispensing, and the simpler laboratory methods necessary for diagnosis. An elementary knowledge of anatomy and physiology is assumed and an effort has been made to use simple language. A few statements have crept in for which the scientific support is somewhat shaky, as for example that "blackwater fever is brought about by the presence in the blood of poisons which act in an acid medium, this acid medium being the result of imperfect oxidation in the tissues." It would save some un-learning to say, in a book of this nature, that, apart from the fact that blackwater fever is associated with malaria and precipitated by an antimalarial drug, we do not know what brings about this disease. The "warning symptoms" given as an indication of potential blackwater fever are nothing more than those of chronic malaria.

It is, however, no mean effort to condense into simple form the complexities of modern medicine, and in a volume bereft by its very nature of qualifying discussions and explanatory arguments it is almost impossible to avoid dogmatic statements. Dr. Chesterman has devoted himself to a difficult task with the zeal and skill that characterises all his work, and has produced a book that has already proved its worth; this edition should provide useful guidance not only to those for whom it is intended but to nurses and others assisting in medical work in the tropics.

The Troubled Mind

By HARRY ROBERTS. With Chapters on the *Insanities* by MARGARET NELSON JACKSON. London: John Murray. 1938. Pp. 284. 6*s*.

THOSE who deplore the number of popular expositions of medical psychology as well as their uneven quality should note that the authors of this one have exceptional qualifications for their task. They are not only entitled from experience respectively in general practice and in mental hospitals to speak with authority on the troubled mind, but their skill in presenting medical issues clearly to the intelligent but uninstructed public and their interest in the social aspects provides additional justification for their entry into the crowded lists. Their book gives a reliable and sensible account of psychiatry as seen mainly from the psychological side. It includes brief clinical descriptions of the various disorders, as well as of mental defect, and some just reflections on sterilisation, euthanasia, and other socio-medical questions. Dr. Roberts, who is responsible for all but the chapters on insanity—and presumably also on mental defect—frequently finds occasion to join issue with Freudian doctrine; his objections are sometimes sound and telling, sometimes less fair and informed. It is perhaps questionable whether polemics are in place in a book of this description, or indeed references (fairly frequent here) to writers whose names and work are likely to be unknown to the non-medical reader. Occasionally Dr. Roberts's obiter dicta make one rub one's eyes—e.g., "sound philosophers and the unimaginative are alike exempt from neurosis"; "the forms and causes, the appropriate treatment and the prognosis are as various in mental as in physical ailments"; and his comment on Pascal. Some of the references to heredity are a little out of date. On the whole, however, in spite of defects associated with compression and simplification the book is clear, accurate, and well balanced. Not only the public but the junior medical student and the nurse would get a better grasp of the subject from it than from some more pretentious books.

Papers on Psycho-Analysis

Fourth edition. By ERNEST JONES, M.D., M.R.C.P. Lond., President of the International Psycho-Analytical Association and of the British Psycho-Analytical Society. London: Baillière, Tindall and Cox. 1938. Pp. 643. 25*s*.

THIS, the fourth, edition of Dr. Ernest Jones's well-known book contains a good deal of fresh material, some of the papers in earlier editions having been omitted. Each of the thirty-two chapters stands complete in itself, and a reader familiar with the subject may regret that its historical development is not made clear. Recent papers of practical interest deal with problems of adolescence and the relation between psycho-analysis and psychiatry, and the general trend of all the papers is towards the application of psycho-analytical principles to the understanding of actual problems of life and behaviour. The final chapter on early female sexuality reveals a healthy difference of opinion between analysts themselves.

Although Dr. Ernest Jones cannot be accused of undue simplification, yet his language is always clear, and difficult subjects are presented with the minimum of technical jargon. The book can be recommended not only to the specialist but to the medical man who wants an authoritative exposition of psycho-analytical teaching. It contains a glossary and a copious index.

Myocarditis

The St. Cyres Memorial Lectures. London: Eyre and Spottiswoode. 1937. Pp. 152. 10*s*. 6*d*.

A LECTURE in memory of Viscount St. Cyres is delivered annually on the subject of myocarditis; and six of these lectures have been gathered in this book to be sold for the benefit of the National Hospital for Diseases of the Heart. In order to include the effects of coronary disease the term "myocarditis" has been interpreted by most of the lecturers in its widest sense so that the book forms an interesting commentary on the development of our knowledge of the subject during the past twelve years. The lecture given by the late Dr. Strickland Goodall in 1927 shows that although it was recognised then that the state of the myocardium might be reflected in electrocardiographic changes, the nature of these was not precisely determined and reliance had to be placed on what might now be considered inadequate

physical signs. In the lecture for the following year Prof. K. F. Wenckebach, discussing the beri-beri heart, revived the idea that the right heart might fail long before the left. Though little is heard of it in this country, in America the distinction between right and left heart failure is regarded as one of the most important changes of viewpoint of cardiac failure during the past decade. Prof. Wenckebach suggests that the failure of the heart in beri-beri is due to imbibition of water by the myocardium and gives reasons why the older theory of vagus degeneration is an inadequate explanation. In 1929 the St. Cyres lecture was delivered by Dr. R. O. Moon, whose wider view of the causes of myocardial disease contrasts with the present-day obsession with the effects of coronary disease, though he places more emphasis on fibroid and fatty changes of the heart muscle than now appears warranted. Dr. John Cowan in 1930 discusses angina pectoris, pointing out that the theory of muscle ischæmia only partially explains its mechanism; for in most cases of angina there is evidence also of the existence of a highly sensitive nervous factor. This year for the first time in the series of lectures angina is distinguished clinically from coronary thrombosis, and the importance of the compensatory anastomoses which may develop after a coronary thrombosis is recognised. Of the fifth St. Cyres lecture, delivered by Sir Thomas Lewis, no record is available.

In 1932 Strickland Goodall was again called on to lecture. Some of his teaching—for example on the interpretation of the R wave in lead II, and the treatment of heart failure with sufficient fluid to reduce the viscosity of the blood—was unorthodox even then. Five years ago Dr. John Hay delivered the last lecture printed here. By recording a series of cases with electrocardiograms he shows how the use of the electrocardiogram has aided the recognition of lesions of the coronary arteries. He deals briefly with the use of lead IV which was just being brought into service to demonstrate lesions in the silent areas of the heart and has since proved of value in aiding the recognition of atypical and aberrant forms of coronary disease. In his concluding remarks Dr. Hay looks forward to the time when the electrocardiogram will have placed the clinical diagnosis of coronary insufficiency on a sure basis and can be discarded in favour of clinical methods.

L'enchevillement central des fractures diaphysaires

By PAUL-LOUIS CHIGOT. Paris: Masson et Cie. 1937. Pp. 104. Frs.25.

THE work represents the results and conclusions of a combined experimental, pathological, and clinical study of the technique of intramedullary bone-pegging operations and of the different types of bone used for this purpose. The author reports on his experimental findings after using autoplastic, heteroplastic, and os purum grafts in a series of fifteen rabbits and four dogs. The bones, with grafts in situ, were radiographed at once, and regularly thereafter. The specimens were later examined histologically after decalcification. In such radiograms as are shown the progressive disintegration of grafted bone is well seen. A feature of interest in the histological study is that osteoclastic formation was not noted before the sixtieth day after introduction of the grafts. The use of os purum has been shown by Prof. Chigot to jeopardise the strength of osteosynthesis, since he notes a definite loss of resistance as compared with autogenous or homogeneous grafts prepared in the usual way. He reviews briefly the various other materials, metallic and non-metallic, used for osteosynthesis, and expresses the opinion that the principle underlying their use is fundamentally wrong. The wave of opinion favouring the use of stainless steel pins seems to have regressed, and the most recent practice tends to support his view.

Prof. Chigot analyses a series of seventeen fractures in the human subject, most of them recent ones, submitted to intramedullary bone-pegging. He sponsors this treatment in irreducible transverse fractures of the shafts of long bones where the open angle at the fracture line is less than 140° with the axis of the shaft. In our experience, however, such transverse fractures should be capable of reduction by modern traction methods and show little tendency to subsequent displacement if fixation is adequate. Comminuted fractures are acknowledged to be unsuited to this method of treatment.

The account of the author's technique and clinical results is detailed. In 13 of the 17 cases "full function" was obtained, but it is hard to assess the advantages of the method since the criteria of full function as here understood are not enumerated. Another most important piece of information omitted is the average period of disability in the various fractures operated on. Without such standards of comparison it is impossible to evaluate the results obtained or to compare them with those achieved in this country, almost exclusively by closed methods, in such cases as he cites.

A Textbook of Clinical Periodontia

Second edition. By P. R. STILLMAN, D.D.S., F.A.C.D., F.A.A.P., formerly Instructor in Periodontia, Columbia University, New York, and Clinical Professor of Periodontia, New York University; and J. O. MCCALL, A.B., D.D.S., F.A.C.D., F.A.A.P., formerly Professor of Oral Hygiene and Periodontia, Univerity of Bufflalo, and Instructor in Periodontia, Columbia University, New York. London: Macmillan and Co. 1937. Pp. 282. 15*s*.

IN 1922, when this book first appeared, the conception of traumatic occlusion as an important ætiological factor in pyorrhœa was new, and was indeed largely the outcome of work by Stillman and McCall. Since then the theory has been widely accepted in America though it has made little headway in this country. In this edition the book has been considerably revised but not changed in essentials. The authors have adopted the views on the pathology of pyorrhœa put forward by H. K. Box and regard them as confirming their theory. We still find it difficult to understand the suggested rôle of traumatic occlusion in pyorrhœa, or even to understand exactly what is meant by the term. Abnormal occlusal relationships are familiar to all dentists and it is known that they sometimes lead to strain on the supporting tissues of the teeth. But Stillman and McCall seem to go much further than this. They assume the existence of traumatic occlusion and regard the occurrence of pyorrhœa as corroboration of its presence in any case. The rather grandiloquent and confused style of writing does not make this book any easier to follow and the terminology coined by the authors is a further obstacle to its understanding. We are at a loss to account for the way in which this theory has come to dominate dental literature in America.

THE LANCET

LONDON: SATURDAY, APRIL 16, 1938

PROGRESS AGAINST RHEUMATISM

THOSE of us who were not present in Oxford or in Bath will wish to know how the campaign against rheumatism is going. In the published summaries of papers read at the meetings we may find little that is new, either of fact or of interpretation. But if we look also in an internationally contributed series of papers,[1] which, like the Bath conference, celebrates the 200th anniversary of the Royal National Hospital for Rheumatic Diseases, we shall find something of a conspectus.

Acute rheumatism, "juvenile rheumatism," or the disease that produces arthritic, cardiac, and choreic manifestations, subcutaneous nodules, and erythema circinatum, is now clinically fairly well defined and its course and behaviour are well known; incidentally, the indefinite "growing-pains" of childhood are no longer attributed to it.[2] Its cause is obscure, but less is being heard for the moment of a virus ætiology and increasing emphasis is being laid on the hæmolytic streptococcus and on the nexus between streptococcal sore-throat and attacks or relapses of acute rheumatism following them after a latent period. It is agreed that neither the arthritis nor the carditis of acute rheumatism is demonstrably due to streptococcal invasion of joint or heart, and it is suggested that the morbid changes in those tissues may be brought about by some chemical derivative of the streptococcus acting on tissues in some way sensitised to it. There has been some discussion whether this hypothetical mechanism should be called "allergy"; Prof. LUDWIG ASCHOFF,[1] for instance, says that rheumatism is not an allergic disease but an infective or toxic disease with an allergic phase. The terminology, however, seems unimportant beside the urgent need for elucidation of the reaction in terms of immunological chemistry, and for a means of recognising and forestalling it during the latent period. In this connexion we recall Dr. BERNARD SCHLESINGER'S recent Milroy lectures[3] in which he produced a short series of observations suggesting that when aspirin is given to rheumatic children during and for four weeks after every upper respiratory infection the incidence and the severity of rheumatic relapses following those infections are diminished. This is surely a corner of the rheumatism problem that calls for intensive investigation. Meantime the treatment of the condition resolves itself almost entirely into adequate rest and general hygiene, and, since the majority of the patients belong to the less well-off urban population, that is largely an economic problem. Dr. WILFRID SHELDON[2] referred to the "facilities in this country for the organised control of the period of convalescence" of rheumatic children. Dr. SCHLESINGER described those facilities in greater detail and showed that a reasonably effective system of rheumatism clinics, special schools, and country convalescent homes exists in London, but is lacking in many other parts of this country where rheumatism is rife; it is expensive, but he argues that, even on coldly economic grounds, the prognosis of juvenile rheumatism well managed is good enough to justify it.

Rheumatoid arthritis is less clearly definable as a "clinical entity." It has even been suggested that it has affinities with the juvenile and cardiac rheumatism that we have just been discussing. Dr. F. J. POYNTON[1] brings forward a number of borderline or mixed cases in support of this view and mentions also the well-known occasional finding of subcutaneous nodules in rheumatoid arthritis and the accelerated sedimentation-rate in both conditions. He concludes that the "rheumatisms" are more allied to one another than to any other disease, and infers that some ætiological factor must be common to both, such as, perhaps, a congenital or inherited weakness of connective tissue. The hypothesis, however, is so tentative that Dr. POYNTON offers it to the investigator, rather than to the practising physician at the moment when he is occupied with the diagnosis, prognosis, and treatment of a given case. For there is a difference, which we ought frankly to recognise, between the academic and the practical attitudes of mind in medicine. Dr. PHILIP HENCH,[1] a leader among the American rheumatologists, illustrates this in another way. In an admirably clear and objective summary he marshals the evidence for and against the theory that rheumatoid arthritis is a disease of microbic origin. It is inconclusive. As a clinical investigator Dr. HENCH then admits that the theory can be neither accepted as true nor rejected as false; he regards the evidence for it as stronger than the evidence against it, but preserves an open mind. As a practising physician, however, he cannot wait till the issue is settled; so he accepts the microbic theory as a working hypothesis and treats his patients on the assumption that infection is an important factor in causing their disease. Progress in medicine requires the constant interaction of these two attitudes of mind, each influencing and moulding the other. Dr. HENCH as an investigator described at Bath his observations on the apparent effect of jaundice in causing remission of the symptoms of rheumatoid arthritis; this work breaks new ground and may be a valuable clue to the mechanism by which periarticular swelling and pain are produced.

Gout was the topic of another of the sessions at Bath. It has been attracting more interest of late from several points of view and is by no means a disappearing disease. There is a tendency to narrow its clinical definition to the characteristic changes in joints and bursæ, although Dr. LESLIE

[1] A Survey of Chronic Rheumatic Diseases, contributed by contemporary authorities in commemoration of the bicentenary of the Royal National Hospital for Rheumatic Diseases, Bath, 1738-1938. London: Humphrey Milford, Oxford University Press. 1938. 18s.

[2] *Lancet*, April 2nd, 1938, p. 767.

[3] *Ibid*, March 12th, 1938, p. 593; March 19th, p. 649.

HILL, in the paper we published last week, argued persuasively for the existence of a truly gouty fibrositis possessing many clinical features in common with typical articular gout. The importance of recognising atypical articular cases that resemble rheumatoid arthritis and spare the great toe, is emphasised; a history of episodic attacks is their characteristic, and the finding of tophi or of a raised blood uric-acid level are confirmatory signs. The relation of the abnormal uric-acid metabolism to the inflammatory attacks in gout is still obscure. Colchicum remains the treatment of choice in acute gout, and cincophen is being less warmly recommended than formerly and more often warned against on account of the risk of hepatitis.

We have mentioned a few of the rheumatological problems in which the slow process of acquiring knowledge, sifting and correlating it, and applying it, is making some progress; there is no doubt that interest is growing and effort is increasing, and it is quite clear that for any whose lines of work bear on it, whether scientific investigators, observant clinicians, or organisers of social welfare, rheumatism is far from being a dull subject.

RHYTHMIC ALTERATIONS IN BRONCHIAL CALIBRE

THE survey by Mr. MAXWELL ELLIS of present-day conceptions of bronchial architecture and function, published in our columns last week, incorporates an account of his own experiments planned to elucidate the nature of the rhythmic alterations in the bronchial calibre which synchronise with the respiratory movements. With the aid of a sensitive method for direct record of changes in the calibre of the bronchial tubes in the anæsthetised dog with closed thorax, he has been able to show that adrenaline dilates and pilocarpine constricts the bronchi. Clear-cut evidence demonstrates the presence of vagal broncho-constrictor fibres which are in a state of tonic activity. The absence, in any of the experiments described, of broncho-dilatation following stimulation of the peripheral end of the cut vagus is in itself important. In the dog the cervical vagal and sympathetic fibres, as also the thoracic vagal and sympathetic fibres, are intimately associated, and sympathetic fibres were probably being stimulated with the vagal broncho-constrictor ones. Although excitation of vagal fibres alone generally causes broncho-constriction, it sometimes gives rise to broncho-dilatation[1] which, moreover, may be produced in some animals by stimulating the peripheral cut end of the sympathetic nerves.[2] How far this latter effect is to be attributed to the presence of broncho-dilator fibres from the upper thoracic sympathetic outflow looping up and then down in the cervical sympathetic bundle, or to an axon reflex, or to fibres with their cells of origin in or above the ganglion nodosum remains uncertain. The importance of the work described by Mr. ELLIS lies in the contribution of definite evidence that uncomplicated broncho-constriction takes place as a result of vagal stimulation in dogs under specified experimental conditions.

The fact that such varying results have been described by different observers should tend to shift the inquiry further afield. If we regard the main aim of investigations on bronchial mechanism in animals to be the acquisition of knowledge which will throw light upon related mechanism in man, then the study of the extrinsic and intrinsic control of the bronchial tubes is not enough. For while we know that in man functional control is often deranged, we suspect that no less often the muscle itself is in an abnormally reactive state. It is recognised that the variations in response of the bronchi and pulmonary vascular bed to similar stimuli may be largely due to the conditions of the experiment, the choice of anæsthetic, and the species of animal selected. Until the significance of these factors can be assessed special caution must be used in applying to man conclusions drawn from the interpretation of animal experiments. The pulmonary reactions of the dog, pig, and guinea-pig to nerve stimulations and to drugs differ from one another and there may even be wide variations in animals of the same species. It is pertinent to inquire whether the pulmonary responses in man resemble any one species type. If they do, to which of the animal species are they related, and under what conditions? Until these are answered we are hardly justified in any assumption that the functional patterns of lung responses in man are more like those in the dog than those in the pig or any other animal. It will be recalled that the failure to reproduce in experimental animals a condition similar in every respect to paroxysmal dyspnœa in man is largely responsible for our ignorance of the underlying cause of this allergic diathesis.

Mr. ELLIS also raises the interesting question of the nature of rhythmic changes in bronchial calibre. He reviews the three possible sources for the production of these movements: intrinsic mechanisms, extrinsic nervous mechanisms, and mechanical influences. His records show that "the bronchial lumen widens during the inspiratory phase and narrows during the expiratory phase of respiration, and that these alterations in bronchial calibre are synchronous with the respiratory movements and accompany them." The results of specially designed experiments made it improbable that extrinsic nervous reflexes are concerned in these rhythmic bronchial movements; as to their possible intrinsic origin, it is conceivable that a rhythmic outburst of impulses from the pulmonary ganglion might give rise to a bronchial rhythm at least as frequent as the respiratory cycles—witness the "rush" peristalsis of the intestines which has been observed, through an abdominal window, to occur in unanæsthetised rabbits. It is significant that the speed of the peristaltic wave is much reduced in animals under an anæsthetic. Such frequent movements of the bronchial muscle have certainly not been observed either in anæsthetised animals or in isolated lung preparations; under

[1] Braencker, W., *Arch. klin. Chir.* 1926, **139**, 1.
[2] Dixon, W. E., and Ransom, F., *J. Physiol.* 1912, **45**, 413.

these conditions the bronchial rhythm, if present, is much slower. Although Trendelenburg failed to obtain evidence of spontaneous contractions of isolated strips of bronchial muscle there is unequivocal evidence that slow rhythmic contractions of the isolated lungs or of the trachea do occur spontaneously or in response to stretch.[3 4 5] They are extensive enough to be detected by the naked eye although how far they are due to a true peristalsis or to "peristaltoid" movement is not known. Mr. ELLIS's view that there is insufficient evidence to attribute the changes in bronchial calibre during respiration to any other cause than the mechanical effects of thoracic movements is thus well founded. It seems possible that their control in health or disease will ultimately prove to be both extrinsic and intrinsic.

SEVEN YEARS P.R.C.P.

ONLY twice during the last hundred years have the fellows of the Royal College of Physicians of London invited their president to hold office for more than five years, and since the incorporation of the college in 1518 there have been only seven presidents who have held continuous office longer than has Lord DAWSON. Sir HENRY HALFORD (1820–44) found the college its noble house, but probably none of Lord DAWSON's predecessors has done more to enhance its prestige and influence. He has regarded the Royal Colleges as being to medicine what the Inns of Court are to law: they are concerned not alone with learning and its advancement, but with the application of learning to current affairs; they have contacts more intimate, more practical, and more human than any exclusively academic body; of all medical organisations they are best fitted to give disinterested advice. Working in close harmony with the Royal College of Surgeons, and also with the new British College of Obstetricians and Gynæcologists, his policy has been to foster the influence which the college should exert in matters of State medicine and of medical education—an influence which, it must be confessed, was on the wane before he took office.

To take its proper place in a live world a college of physicians must keep its ambit wide, and Lord DAWSON has seen to it that the fellowship is truly representative of all specialties and of all parts of the Commonwealth. It has also become more representative of the rising generation. For the younger fellows (as one of them writes) his term of office has been particularly happy, for "he has constantly expressed his desire that they should take an active part in the affairs of the college and he has translated this wish into active encouragement by placing junior fellows on various committees from time to time set up. Moreover he has frequently called on the younger generation to take part in the debates of the regular and special meetings of the comitia; so that the average age of speakers in that august and terrifying assembly must have been considerably lowered in recent years."

Among more specific, though not more important, innovations, Lord DAWSON started the science committee, with representatives of the Medical Research Council and of other bodies granting research scholarships, and initiated the policy of coördinating individual scholarships to large objects—as witness the succession of grants to investigate different aspects of anæmia, the tonsil problem, and rheumatoid arthritis. It was he who had the vision to see that the Prophit bequest, instead of being doled out in unrelated grants, might be used for one vast work, which has actually been started in coöperation with tuberculosis dispensaries, voluntary and municipal hospitals, the General Post Office, the Admiralty, and the universities. When, as often happened, he was asked for personal advice he made it his practice to bring the matter before the college and to act through it. In this way it has taken its share, for example, in guiding legislation on infanticide. He has encouraged its participation in large coöperative schemes such as the curriculum conference and the British Postgraduate Medical School. In a word Lord DAWSON has raised the status of the college from that of a dignified, scholarly, academic body to a position of coöperative leadership in the guidance of the profession and the welfare of the community.

HEALTH OF THE ARMY

ALTHOUGH the general health of the troops throughout 1936 continued to be very satisfactory, the Director-General of Medical Services reports[1] an all-round increase in sickness incidence over that for the previous year. Thus the admissions to hospital exceeded those for 1935 by 35·6 per thousand of the strength, and the number of invalids sent home from abroad was 2·79 per thousand more than in 1935. The principal diseases to show an increase in the year under review were the less serious digestive disorders, skin diseases, and malaria, and, in Egypt and Palestine particularly, sand-fly fever. Judged by the average sick time to each soldier the commands with the highest ratio of incapacity were China, Aden, and Ceylon, and on this standard Bermuda was very much the most healthy station. During the year 1500 invalids, or about 8 per thousand of the strength, were discharged, the main reasons being tuberculosis, otitis media, the effects of old injuries, and schizophrenia.

In 1936, in order to check the falling off in the numbers of recruits, the War Office decided to enlist men below the physical standards with a view to raising them to those standards by special training. A preliminary experiment, confined to men whose weight or chest measurement was unsatisfactory or who had functional defects of the heart, was highly successful, and of 33 men enlisted 24 attained the necessary standards within three months. A centre has therefore been established for the reconditioning of recruits of this type, and a scheme has also been approved by which applicants who are up to standard in all respects except for some curable defect, such as varicose veins or enlarged tonsils, can be enlisted and admitted direct to hospital for treatment.

[3] Horvath, A., *Pflüg. Arch. ges. Physiol.* 1876, **13**, 508.
[4] Luisada, A., *Beitr. klin. Tuberk.* 1930, **73**, 657.
[5] Daly, I. de Burgh, *Trans. med.-chir. Soc. Edinb.* 1936, p. 139.

[1] Report on the Health of the Army for the year 1936. London: H.M. Stationery Office. Pp. 158. 3s.

ANNOTATIONS

AIDS FOR ATHLETES

Dr. Adolphe Abrahams knows a good deal about the influence of alcohol, tobacco, and other drugs on physical efficiency. To the athlete, he said,[1] the problem of alcohol rarely makes an appeal from a purely moral or sociological aspect. In slavish imitation of the training methods of a famous performer he may take draughts distasteful, perhaps even nauseating. Or the total abstinence of a champion may lead him to regard a drop of any alcoholic beverage as virulent poison. Restriction of drinking in the training of old-time pugilists and pedestrians was obviously salutary, and when athletics became fashionable the young bloods of the period naturally imitated the methods of the professional. But nowadays the chronic alcoholic does not contemplate a course of orthodox training, or if he makes the venture he speedily abandons it, and the modern athlete demands a ruling on the purely scientific side. He asks if alcohol is a special indication in the production of the highest form of physical efficiency or he will accept an assurance that by its use efficiency may be reduced. We are entitled to inform him, said Dr. Abrahams, that there is no evidence that alcohol is a good food for muscular work and that Starling's experiments showed a depressant action upon the mammalian heart, dilatation of the ventricles occurring if the proportion in the blood reached 0·06 per cent. Attwater and Benedict's laboratory estimate of the efficiency of the body as a machine—namely, 29·55 per cent. without alcohol and 25·62 per cent. with alcohol—has been confirmed by investigations during mountain climbing.

The difficulty of assessing the influence of tobacco smoking upon athletic capability lies in the unsatisfactory character of control experiments. Up to 30 years ago, said Dr. Abrahams, the non-smoking athletic young man was a rara avis and any contests that might have been arranged between smokers and non-smokers would have been overwhelmingly in favour of the former. Since then there has been an increasing tendency among young athletes to forgo tobacco, but although more material is available control experiments are still far from convincing. Traditionally smoking is "bad for the wind," but "the wind" is not an entity; it is a convenient synonym for the capacity for exertion, in which a number of factors are concerned. To be sure that smoking is bad for the wind we must be prepared to demonstrate either direct poisoning of the heart muscle, or its nervous mechanism, or some impairment of the oxygen-carrying capacity of the blood. It is probable, in Dr. Abrahams's view, that smoking does reduce efficiency in some measure, trivial it may be; but in modern competition even a tiny reduction is of consequence. Against this is to be set the sedative effect of tobacco on the highly strung emotional type not infrequently encountered in the athletic world. It is significant that while some of the greatest track athletes smoke throughout their training, and even to the moment preceding their contest, long-distance cyclists are almost invariably non-smokers. They do not however abstain from tobacco owing to a conviction that it is bad for the wind, but because they are not interested. The long-distance cyclist, it seems, has a relatively stolid mentality and temperament, with no urge towards stimulants, anodynes, or narcotics.

In his concluding remarks Dr. Abrahams considered the possible existence of some drug capable of producing or increasing physical efficiency. Several preparations have secured an undeserved reputation; suggestion no doubt plays the greatest part in any benefit claimed. But it is, he remarked, possible that a drug which cuts out inhibitions might enable the system to draw upon its reserves of energy in moments of stress. Continental authorities have thought it necessary to warn their athletes against the "dangerous practice of doping." The International Olympic Council at their recent meeting condemned the use of such things, but only in general terms. So far as this country is concerned, Dr. Abrahams said, the practice of doping must be non-existent, adding "whatever obtains elsewhere, the sporting spirit of the nation would revolt against systematic application of anything of the kind, save on special occasions in the interest of strict scientific investigation."

BLOOD TRANSFUSION IN WAR

RECOGNISING the important place that blood transfusion has come to hold in the treatment of injuries, the Spanish Republican Government decided in September, 1936, to set up a transfusion service for the benefit of their armies. The medical officer in charge, F. Durán Jordá, has recently published[1] an interesting and well-illustrated account of his work. It was realised at the outset that a war-time transfusion service depending on voluntary donors must have as its base a large town where enough volunteers are easily obtainable. It must also include a system of storage and distribution by which blood is ready immediately at any point where it is needed by the military surgeons. The headquarters of the service was therefore established in Barcelona, where no difficulty was experienced in finding volunteers. By October last a panel of 4395 donors, mostly young women, had been enrolled; in all the blood had been tested for syphilis and malaria. The four blood groups were represented as follows: Group I, 3·1 per cent.; Group II, 47·5 per cent.; Group III, 7·8 per cent.; Group IV., 41·4 per cent.—the Madrid transfusion unit, described by R. S. Saxton in our columns last autumn[2] found they could dispense with the two smaller groups. The blood is taken from fasting donors, in order to avoid possible coli-bacillæmia and an excess of the products of digestion, which might cause a reaction. From each donor 400 c.cm. is received into a flask labelled with his group and identification number and containing 40 c.cm. of citrate solution. The blood in each flask is tested to confirm the group and cultured to ensure sterility. After 24 hours batches from one group are pooled, filtered aseptically, and kept at 0° C. A specimen is tested after filtration to make sure that there has been no hæmolysis. The blood is then packed in glass ampoules specially designed, with a fitted tube and injection needle, for immediate use, so that transfusion can be easily carried out at any time, under any conditions, and in any quantity. Each container holds 400 c.cm. of blood under a pressure of two atmospheres, and it can be given so quickly by this means that Jordá mentions having himself given 40 transfusions (27 litres in all) in three days.

The transfusion unit consists of a railway coach, fitted with cold-storage facilities, from which supplies

[1] Introducing a discussion on April 12th at the Society for the Study of Inebriety.

[1] Jordá, F. D., *Revista de Sanidad de Guerra*, 1937, **1**, 307.
[2] Saxton, R. S., *Lancet*, 1937, **2**, 606.

of blood can be distributed and in which the operation can be performed when necessary. After being inspected to exclude infection, shown by a dark venous colour, and hæmolysis, the ampoule is placed in water at 45° C.; Jordá affirms that reactions can be entirely avoided by giving the blood at a temperature of 42° C. (113° F.), but great care must be taken to avoid over-heating and consequent hæmolysis. The number of transfusions provided by the Barcelona service is not stated, but the only complication reported was an occasional rigor. Observations have been carried out at the centre on the changes taking place in stored citrated blood—red and white cell count, erythrocyte resistance, and the content of complement, glucose, and urea, and on the effect of adding glucose to the stored blood. The results support the view that citrated blood can be stored for at least 7–14 days without serious deterioration, and show that addition of glucose is unnecessary. It has been suggested that the inclusion of citrate may have inconvenient consequences if much blood is given, as in large drip transfusions after serious hæmorrhage. To avoid this danger and to make use of unfortunately large supplies, Dr. Saxton has been experimenting with cadaver blood [3] during his work with the British ambulance unit in Spain. As can be seen from his account on p. 916 of our present issue he has been working under far more exacting conditions than his colleagues in the railway coach, but he has been able to confirm the Russian observation [4] that healthy cadaver blood does not clot on standing and therefore needs no anticoagulant. Clearly this method of transfusion has serious difficulties. Blood must be collected at the front within six hours of death and stored in conditions where it is sometimes impossible to maintain refrigeration. But it is in just these circumstances that suitable live donors are scarce, and with a big and efficiently prepared organisation it might well be possible on a large scale to use the dead to save the dying.

OCCUPATIONAL THERAPY

THE harmful moral effects of unemployment are now a commonplace of social discussion. Occupation, preferably congenial occupation, is recognised to be essential to our well-being; extensive studies are made of the psychological ill effects evident in men who have been long out of work, and facilities are provided for remedying these to some extent; training centres are established; and, in the circumstances of ordinary remunerative work, industrial psychology and vocational guidance are valued, even in their modest beginnings, for what they can contribute to health and happiness. It is therefore natural that occupation as a form of treatment for mental illness should have been much insisted on of late years. In 1933 the Board of Control published a memorandum based on the practice in other countries, which has served as an outline for the organisation of occupational therapy in many institutions here; and now a brochure has been compiled for nurses,[5] and a manual [6] of the subject written by the medical superintendent of a Yorkshire mental hospital. It might seem that the effort to which these publications testify is belated, since in Scandinavia, Germany, Holland, and the United States much had been done before 1933. But, as Dr. Rees Thomas points out in his foreword to Dr. Russell's book, the principles of occupational therapy were clearly stated and its practice introduced in Great Britain a hundred years ago, first of all in Yorkshire by Dr. Ellis at Wakefield and Samuel Tuke at The Retreat, and later in other parts of England and in Scotland. Unfortunately the good beginning was not followed up as it might have been; although patients in mental hospitals worked, it was more for its contribution to the hospital economy than to the patients' well-being that the work was arranged, and esteemed, by those in charge. In this century a fresh impetus to occupational therapy in Germany and neighbouring countries was given by Dr. Hermann Simon, who at Gütersloh demonstrated that there are hardly any of the chronic insane who cannot be induced to work, and that by the energetic use of occupation the behaviour of such patients can be got to approximate to that of normal healthy creatures, with much consequent improvement in the atmosphere of the hospital. His drastic system, however, left little or no room for recreation, and has seldom been adopted elsewhere without modification. In the United States this form of treatment developed on more individual lines: regimentation was avoided and the methods used were successful with those early and acute, or neurotic, cases which are more likely to be met with in a psychiatric clinic than in a mental hospital. Where in England after the late war occupational treatment was specially pursued—e.g., at Gartnavel, the Maudsley, and Dorset House—it was the American rather than the Gütersloh system that prevailed. It is indeed a defect in Dr. Russell's otherwise excellent book that he says so little relatively about the problems which neurotics and acutely melancholic, stuporose, manic, or agitated patients present to the occupational therapist. Since, however, chronic and convalescent patients are the ones who suffer most obviously if they are left to loiter and mope and idle the day away, and these are, moreover, the most numerous among the mental hospital population, they must be the chief object of the occupational therapist's interest. The practical guidance now offered to this end by the publications mentioned will, it may be hoped, gradually be enlarged by the working out of rules and indications for prescribing less arbitrary than those now employed. Research and a theoretical basis are needed.

SEX HORMONES AND HYPERTENSION

IT is now twenty years since Steinach first advocated the operation of "vaso-ligature" as a rejuvenating measure, and from time to time he has attempted to satisfy his critics by modifying the operation. Basing his work on the general assumption that the beneficial results of "vaso-ligature" are due to a renewed secretion of a testicular hormone, he has also continued to seek evidence in support of the view that the arrest of senile processes is due to a widespread hyperæmia, particularly in the brain, caused by the increased hormone production. So far, however, it cannot be said that these claims have been fully justified. More recently he has, with Peczenik and Kun,[1] investigated the action of various male-hormone preparations on male patients suffering from hypertension, in order to ascertain whether the vaso-dilatation which they have described in animals after such treatment would also occur in man, and so relieve the symptoms. They record that there

[3] *Lancet* March 19th, 1938, p 693.
[4] Yudin, S. S., *Ibid.*, 1937, **2**, 361.
[5] Occupational Therapy. An addendum to the Handbook for Mental Nurses. London: Baillière, Tindall and Cox. 1938. Pp. 16. 6*d*.
[6] Occupational Treatment of Mental Illness. By J. Ivison Russell, M.B., F.R.F.P.S., D.P.M. London: Baillière, Tindall and Cox. 1938. Pp. 228. With 41 illustrations. 6*s*.

[1] Steinach, E., Peczenik, O., and Kun, H., *Wien. klin. Wschr.* Jan. 28th, 1938, p. 102, and Feb. 4th, p. 134.

was a fall in systolic blood pressure in 31 of 49 cases which were treated with either androsterone benzoate or testosterone propionate, and that in 39 the state of hypertonus, which they differentiate from hypertension, was relieved. They also report that subjective symptoms such as headache, sleeplessness, and tiredness were improved. A further group of patients was treated with small quantities of œstradiol benzoate in addition to the male hormone, and cases which had proved refractory to the administration of male hormone alone showed improvement under the dual injections. In discussing their results, Steinach and his co-workers put the view that the hormone responsible for the vasodilatation and for the depression of the vasomotor centre is similar to the female sex hormone. Work they have published in these columns [2] suggested that male hormone when injected into males is converted into an œstrogenic substance, and they therefore suppose that the success of their clinical treatment in male patients was due to the non-specific influence of the converted male hormone.

It is difficult to evaluate these observations satisfactorily, for the data presented are somewhat inadequate. For example the wide fluctuations which, as is well known, take place in the systolic blood pressure from day to day make it hard to accept Steinach's interpretations of the changes in pressure he records. In this connexion it is noteworthy too that the diastolic pressure—fluctuations in which are usually regarded as having a more direct relation to changes in the vascular system—was either unaffected or raised in most of the cases for which data are presented. One of the more surprising suggestions contained in these papers is that œstrogenic substances necessarily act synergically with male hormone. The dose of 60 μg. of œstradiol benzoate had no effect when injected by itself; yet it considerably increased the activity of a dose of male hormone given at the same time. This finding conflicts with a mass of other experimental evidence which suggests that male hormones and œstrogenic substances are often antagonistic substances, the one neutralising the effects of the other.

As Steinach points out, available means of lowering blood pressure are unsatisfactory, and the fall they produce is often followed by a rise. One of the great advantages claimed by Steinach for male hormone is that its effects last for months or even years. Whether his interpretations are accepted or not, his method should receive a trial.

MENS SANA IN MUNDO INSANO

ONCE a year the British Medical Association gives a member of our profession the chance of telling the public what it ought to know about its own health. The Sir Charles Hastings lecture, delivered last week by Dr. H. Crichton-Miller of the Tavistock Clinic, was stimulating rather than reassuring, for in his opinion the changes in civilisation are all making for the success of authority over independent judgment. Industrial man is passing through an acute phase of biological readjustment, and the increase of nervous disorder among our machine-minding robots is only to be expected unless we can educate the worker to use his leisure for recreation rather than escape. "It is usually supposed," said Dr. Crichton-Miller, "that the machine does damage by adding to the pace of life. The real question is how far we choose to rush through life, and how far we choose, in leisure if not in work, to ensue peace and seek isolation. The really detrimental factor in our mechanised age is not the rush but the choice." Politically, the lecturer believes, the urgent problem of democracy and therefore of our nation is to lower suggestibility in the electorate, and he proposed psychological tests of judgment as a qualification for the franchise. A more viable gleam of hope appeared when he pointed out that "docility, gullibility, obsessions, fanaticism—all the features that invalidate a vote—are for the most part referable to faulty education in home and school"; but it was dimmed by his declaration that no sort of environmental change can ever neutralise the grim fact that the intelligence quotient of the nation is declining. The efforts of the medical profession to ensure that the above-average accept the onus of fertility and the below-average face the necessity of limitation, have "met with organised frustration." A possible, if partial, comment on this assessment of the situation was provided a few weeks ago by Dr. Henry Yellowlees in another address to laymen on mental hygiene in modern life [1]: "I don't think," he said, "we can expect to bring about new heavens and a new earth just at once, but if we can equip our children to carry on with just a little more courage and patience and good cheer than we have sometimes shown, we may well be content." To accept this is not to underrate the importance of the plea for remedial measures which Dr. Crichton-Miller so cogently put forward.

THE CARRIER COW

ONE hundred odd children whose sickness was due to drinking raw milk infected with germs from the dung of a cow which itself was not ill—the ramifications of this outbreak of gastro-enteritis at Wilton [2] like others of its kind recall the story of the House that Jack Built. A certain group of consumers, chiefly children, who drank a particular supply of raw milk on Oct. 26th and 27th, 1936, developed 12 to 24 hours afterwards a temperature of 99° to 103° F., headache, nausea, and severe but transient vomiting; later diarrhœa set in with watery stools which did not contain blood. All the patients recovered. Unfortunately fæcal specimens were not examined till convalescence was well established, and proved negative, but serological tests of the blood of nine convalescents were made. All showed specific agglutination for a salmonella bacillus of type "Dublin," and a bacillus of this type was isolated from milk delivered to the school concerned on Oct. 29th and later from milk supplied by the same producer. No illness was found among the personnel concerned at the farm or dairy, though one of the employees at the distributing dairy had specific agglutinins in his blood; but defects observed in the technique of operating the mechanical milking plant in use at the farm led to the suspicion that the milk might have been contaminated with dung. An examination of blood samples from the herd of 51 cows led to the provisional isolation of three cows giving an agglutinin titre of 1 : 400 or 1 : 800 when tested for H agglutinins against 24-hour-old broth cultures of the "Dublin" organism isolated from the bulk milk. The milk of all three cows gave negative results but the dung of one of them showed a heavy growth, in three separate tests, of the organism. After the removal of the carrier cow from the herd—its fate is not stated—and an alteration in the mode

[2] Steinach, E., and Kun, H., *Lancet*, 1937, **2**, 845.

[1] *J. R. Inst. publ. Hlth Hyg.* April, 1938, p. 387.

[2] A Report on an Outbreak of Food Poisoning due to Salmonella, Type "Dublin" and conveyed by Raw Rilk. By E. T. Conybeare and L. H. D. Thornton. *Rep. publ. Hlth med. Subj., Lond.* No. 82. H.M. Stationery Office. 1938. Pp. 8. 2*d*.

of operating the mechanical milking plant, samples of the bulk milk examined over a period of six weeks gave negative results for the organism.

The only previous outbreak due to the "Dublin" type of salmonella of which detailed records are available at the Ministry of Health occurred in London in 1928 when 22 persons developed gastro-enteritis after eating junket. The authors draw attention to the difference in time of onset of symptoms between this type of food poisoning and the toxic food outbreaks associated with the presence of *Staph. aureus*. In the latter the onset is usually within three hours of the suspected meal and clears up rapidly. On the other hand the diarrhœa in the outbreaks due to salmonella of the "Dublin" type lasts less long and is less subject to relapse than that due to dysentery bacilli of the Flexner type.

Two considerations are pertinent to the outcome of this neat piece of detective work. One is that a medical officer who has incriminated milk or food containing milk as a source of illness should not only investigate its preparation and obtain material for pathological examination from it, as well as from the patients in the acute stages of the illness, but should also bear in mind the possibility of an animal vector and enlist veterinary coöperation. Another more elementary lesson is implied in the comparison of this outbreak with five more serious ones in England between 1929 and 1936 due to infected raw milk, in all of which the milk-supply to which the infection was directly traced had passed routine bacteriological standards for cleanliness. Sir Arthur MacNalty in a prefatory note to this report points out once again—and it is evidently still necessary to reiterate this thesis—that clean raw milk is not necessarily safe milk, and that the only practicable way to reduce the risk of such outbreaks is efficient pasteurisation or some other suitable form of heat treatment.

MEDIÆVAL BATH

THE city of Bath which Mr. James has set himself to describe [1] is not the city of the eighteenth century with which most readers are familiar. The subject which has attracted him is the transition from the small country town, built round the monastic establishment, entirely controlled by the Church, and subsisting principally by the manufacture of cloth, to the prosperous spa (now celebrating its bicentenary) which gradually rose from the ruin which the dissolution of the monastery had brought upon it. Its total population, confined within the narrow limit of the city walls, cannot, Mr. James computes, have reached a larger number than 1200 individuals; and the tortuous lanes and alleys, clustered round the Abbey, ran between small houses with thatched roofs. In 1539 the dissolution of the monastery brought disaster to the place, but the corporation, which till then had been subservient to the bishop and the prior, faced their difficulties with boldness and towards the end of the century had received a charter of full incorporation from the Crown and had been invested with all the property and rights which had formerly belonged to the Church. Before they had reached this height of their ambition they had realised that the future of the city must depend in the main upon the baths. These had been for centuries renowned, but so long as they remained the property of the Church they were of but little value to the citizens, beyond the fact that they attracted a certain number of pilgrims, chiefly, it would seem, of the poorer classes. With the advent of the corporation to power the attractions of the spa were soon improved so that by the middle of the sixteenth century they had become more widely known. In the second half of the century appeared two books lauding the efficacy of the waters: one by Dr. Turner who was also Dean of Wells, and a little later one by Dr. Jones who practised medicine not only at Bath but at Buxton, so that he may be described as the first of the spa specialists. Jones published his "Bathes of Bathes' Ayde" in 1572, and in 1574 Queen Elizabeth paid a visit to Bath and from that date the town could consider itself established as a social centre for the nobility and gentry of the kingdom. Royalty came again in the person of James the First's queen in 1612, and before the first quarter of the seventeenth century had run its course Bath had become the fashionable resort, familiar to most of us in the literature of the next two centuries.

Mr. James sketches from original documents the "renaissance" which thus took place, and makes it clear that from the time the corporation really possessed power there was a continuous and steady rise in wealth and general prosperity. One of the pieces of evidence is the fact that the London companies of players found it worth their while to pay frequent visits to Bath. Between 1577 and 1617 Mr. James has found that fifty separate visits were made by one or other of the companies. He does not name his authority but quotes in inverted commas the statement: "There are very strong reasons for inferring that Shakespeare did visit Bath, though whether as a player or a patient it is impossible to say." We should much like to know the nature of "the very strong reasons," but Mr. James is silent on the point. If we may be permitted a modest grumble it is because Mr. James has in his later pages rather stinted us of his knowledge. He has told us in detail, and the maps and illustrations are there to show us, what Bath was at the beginning of the "renaissance," but there is no map and no information of what it had grown to in 1700. Presumably there had been a great expansion of the older city, and presumably at some date in this period the old city walls had disappeared. All that Mr. James has told us is that the corporation quite early in the period forbade the thatching of roofs. He tells us a good deal of the various improvements to the baths but leaves us ignorant of the building of the rest of the city. Perhaps in the second edition of his book the author will make this good.

[1] The Baths of Bath. By P. Rowland James. Bristol: J. W. Arrowsmith. Pp. 169. 5*s*.

TRICHINOSIS IN THE UNITED STATES

THE available statistics concerning trichinosis in the United States have been brought together by Dr. Sawitz of the department of tropical medicine in Tulane University of Louisiana.[1] Such statistics can, as he points out, give no more than a rough idea of the real incidence, for not all the States require cases of the disease to be reported, while autopsy data suggest that the official figures are too low in States where notification is compulsory. Nevertheless the data deserve attention. The cases of human trichinosis reported to the Public Health Service in 1915–36 number very nearly three thousand, and since 1930 the annual quota has risen from under a hundred to over five hundred—i.e., from a case-rate of about 1 per million population to 4·5 per million. Whether this statistical increase denotes a real increase it is impossible to say. The ratio of

[1] Sawitz, W., *Publ. Hlth Rep.*, Wash. March 11th, 1938, p. 365.

deaths to cases gives a falling fatality-rate in recent years so that possibly milder cases are to-day being reported which in earlier times would have been unrecorded. Increased interest in the disease may therefore be a factor in the observed rise in incidence. On the other hand Sawitz finds a possible explanation of an increase in mild cases in a change in the preparation of pork products. Formerly such products were usually prepared from one animal and an infected animal might produce severe cases in a limited population. Now sausages and other products are the result of mixing meat from many hogs. An infected animal may thus carry infection to a larger population but in a "diluted" form. On the other hand, such dilution of infected with sound meat does not hold in all countries. Hallén, for example, reports [2] an epidemic of this infection affecting certainly 51 persons in Lindesberg, Sweden, in May and June last year, the result of the importation from Västergötland of three pigs. These went to one establishment and were distributed as raw ham and raw sausages. The owner, his brother, his two assistants comprised four of the nine men who were known to be infected, the rest being women who apparently tasted the raw minced meat when making it up for cooking. There were no deaths. The illnesses were closely followed in 41 of those in whom a diagnosis was made, and in view of the difference of opinion regarding prenatal infection it is of interest to note that one of them was pregnant and was delivered, on the 17th day of her illness, of a girl in whom no evidence of the infection could be detected—a finding which falls in with that of Augustine [3] on a primipara whose infection took place about three weeks before delivery.

To supplement these figures of notifications Sawitz has made a compilation of all cases of trichinosis published in medical journals, and finds that in total between five and six thousand cases have been diagnosed and reported in the United States in the last 100 years. A far higher incidence than this, however, must occur if the statistics of trichinella infections found in autopsies are trustworthy and representative, for Sawitz quotes 3322 post-mortems, in which a real search for trichinella was made, as giving 12 per cent. of positive results. Raw pig's flesh is not commonly regarded in this country as a dainty, so that even should such measly meat pass inspection any outbreak caused thereby is likely to be restricted to immigrants who do not consider its proper cooking a necessary preliminary to its full enjoyment.

TREATMENT OF ACTINOMYCOSIS

RADIATION is very successful in treating actinomycosis localised about the face and neck, fortunately the parts most often attacked; elsewhere it gives disappointing results. Renander's observations [4] at Radiumhemmet in Stockholm confirm previous reports, such as that of R. Stewart Harrison, on which we have previously commented.[5] In the Stockholm series of 52 cases 31 were cervico-facial, and cure was effected in 26. There were 5 fatal cases, in all of which the complications were severe; 2 died after extension of the infective process to the base of the skull, and 1 after it had spread to the mediastinum; pyæmia accounted for a death and profuse hæmorrhage from the tonsillar region for another. The symptoms cleared up as a rule after six months' treatment, but occasionally longer treatment was required. In 13 cases of abdominal actinomycosis Renander found 12 confined to the ileocæcal region, the exception being in the transverse colon. Of these only 5 recovered. All 3 of the thoracic cases ended fatally, as did another with advanced actinomycosis of the female generative organs, and 2 involving the thigh and trunk. The 2 remaining cases were purely cutaneous and recovered. The difficulties of treatment probably arise from application, for irradiation is satisfactory for cutaneous surfaces but not for organs. The choice lies between radium and X ray therapy. No one imagines that surgery is satisfactory; even if it succeeds in eradicating the disease, it does so with considerable mutilation. Potassium iodide though palliative is not curative, and Renander does not think much of it, though Harrison found it useful. With 3 exceptions, in which radium was used alone, all Renander's cases had X ray treatment; this was combined with radium in 15 cases. He used the radium either in the bomb, applied at 5 mm. from the surface and referred to in his report as "teleradium," or by direct application in tubes arranged on the skin surface or introduced into a fistula. The tubes, containing 5–10 mg. of the element, are fixed at intervals of 2–3 mm. on a sheet of lead 1 mm. thick. As the tubes themselves have a filter of 1 mm. of lead, the combined effect is that of a 2 mm. filter. This application is left in place for 15–20 hours. The skin reaction is apparent three weeks later, but is not serious. Radium was used mainly in the cervico-facial type; and teleradium was always combined with X rays. In two or three cases superficial radiation alone proved successful. X ray therapy was given at intervals of 6–8 weeks. In each series of treatments the patient received a dose daily or every second day until a total of 1 unit skin dose (H.E.D. corresponding to 15 Holznecht units) had been given to each dermal field. Roughly ⅓ to ½ H.E.D. is given at each sitting. Renander points out that at the time when these cases were under treatment the unit r had not yet been adopted. He agrees with Harrison that this fractional method causes less local reaction and does less damage to the skin than does the massive individual dosage. He gives a careful clinical account of his cases which should be useful to radiologists faced with the treatment of this rather rare and distinctly troublesome disease.

[2] Hallén, L. G., *Acta med. scand.* 1938, **94**, 354.
[3] Augustine, D. L., *Amer. J. Hyg.* 1934, **19**, 115.
[4] Renander, A., *Acta Radiol.* 1937, Suppl. No. 35.
[5] See *Lancet*, 1934, **2**, 367.

ON Monday evening Dr. ROBERT HUTCHISON was elected to succeed Lord Dawson as president of the Royal College of Physicians of London.

Dr. EDITH SUMMERSKILL, who was returned to Parliament at the West Fulham by-election last week, had stood unsuccessfully for Putney in 1934, and for Bury at the general election of November, 1935. Dr. Summerskill qualified from Charing Cross Hospital in 1924 and is the wife of Dr. Jeffrey Samuel who practises in Wood Green. She is a member of Middlesex County Council.

TAVISTOCK CLINIC.—Dr. Wilhelm Stekel of Vienna will give six lectures at the clinic on Thursday at 8.30 P.M., beginning on April 28th. He will speak on active analysis (a technique of psychotherapy), and the lectures will be open only to medical practitioners. Further information may be had from the educational secretary of the clinic, Malet-place, London, W.C.1.

SPECIAL ARTICLES

NIGHT-BLINDNESS AND VITAMIN-A DEFICIENCY

THE USE OF THE BIOPHOTOMETER

BY N. T. GRIDGEMAN

AND

H. WILKINSON, Ph.D.

(From the Food Research Laboratory, Lever Brothers and Unilever Limited, Port Sunlight)

SEVERAL photometric investigations of dark-adaptation, the clinical manifestation of hemeralopia or night-blindness, have lately been carried out in this country, in which have been used one of two techniques or modifications of them—viz., that of Edmund and Clemmesen (1936) and that of Jeans and Zentmire (1933, 1936, and 1937). Using the former, which requires the subject to differentiate large type-letters printed in nine shades of greyness from a white background (illumination being controlled by a series of Tscherning photometric glasses), Mutch and Griffith (1937) measured the adaptation of 130 young adults and children. They were able to show that subjects with poor adaptation responded to vitamin-A therapy. Using the Jeans-Zentmire technique, in which the subject has to discern the centre spot of a quincunx of unequally illuminated perforations in a black screen (illumination being controlled by a movable Goldberg optical wedge), Maitra and Harris (1937) examined the adaptation of several hundred children and adults. They demonstrated that about 30 per cent. of the children (from East London) and about 10 per cent. of the adults (mostly university students and staff-members) gave subnormal readings, and that 75 per cent. of the subnormal school-children were restored to normality after the administration of 15 drops of halibut-liver oil daily for four weeks.

A new apparatus called the Biophotometer (Fig. 1) has recently been marketed by the Frober-Faybor Company Inc., of Cleveland, Ohio. The design of this instrument is based on that of the Birch-Hirschfeld photometer used by Jeans and Zentmire, but it purports to standardise the conditions of testing, and to refine the method of adaptation measurement to a greater extent than is realisable in any of its forerunners. If either of the apparatuses mentioned above is used, the method of testing a subject is to seat him before a large, brightly illuminated screen for a given period of about 3–10 minutes, then to plunge the room into darkness and take a series of visual-acuity readings at regular intervals for about ten minutes. This gives a measure of the rate of recovery of adaptation. The biophotometer improves on this procedure in several respects. During the whole of the test the subject looks into a light-proof eyepiece—which eliminates dangers of stray light or of the wandering of the eyes to objects of interest in the room. Secondly the "bleaching" is carried out by exposing the eyes to a ground-glass screen indirectly illuminated by a standard light source. Thirdly the illumination of the quincunx of spots is not controlled by means of a movable optical wedge but by having a fixed wedge in front of a small electric light, the intensity of illumination of which is adjustable by a variable resistance. The dial readings on the resistance box are calibrated with the corresponding illuminations in millifoot-candles at the centre spot. The change-over from "bleach period" to darkness is effected by means of a switch, which extinguishes the bright light and simultaneously throws the black screen and the quincunx into position. A small time-piece fitted with a bell-alarm is incorporated in the instrument.

Each reading is taken by switching on the quincunx at maximum brightness, slowly "fading" it until the subject says that the centre dot has just disappeared, and recording the illumination at that point. It is recommended to take a series of such readings over the first ten minutes immediately after entering the room, then to give a five minutes "bleach," and finally to take a series of readings over the next ten minutes.

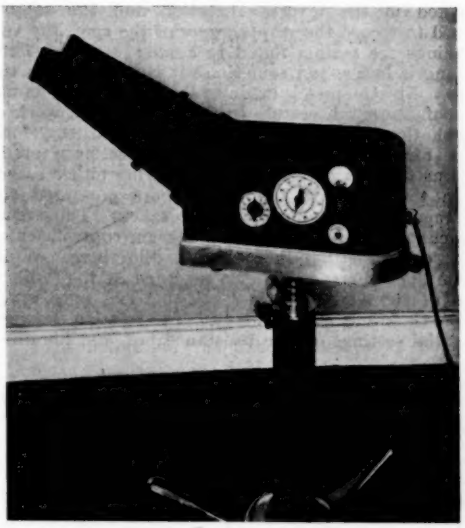

FIG. 1.—The biophotometer.

If the readings, in millifoot-candles, are plotted against time, the types of curves to be expected are those shown in Fig. 2.

Using this method, Jeghers (1937) has conducted a survey of hemeralopia among the students of his university; he has been able to show a significant relation between their powers of dark-adaptation and their diets. He classed 35 per cent. of his subjects as subnormals, all of whom he was able to cure by the administration of daily vitamin-A doses of the order of 30,000 I.U. over periods varying from three weeks to three months.

There is nothing in Jeghers's paper to suggest that he found any imperfections in the technique, but Palmer and Blumberg (1937), in the course of examining 585 school-children, concluded that the biophotometer was unreliable for diagnosing hemeralopia for the following reasons:—

(1) That the control of the illumination of the quincunx is such that the sensitivity attainable at the "bright" end of the scale is considerably less than that attainable at the "dim" end.

(2) That the "learning factor" was large enough to discountenance the value of curative tests. Improvements were noted in the second and third readings of a significant number of untreated school-children.

(3) That, in view of the subjective nature of the test, the establishment of standards of normality was difficult.

These two somewhat conflicting views are the only ones we know to have been published to date.

Through the courtesy of Mr. Frohring of Eff Laboratories Inc., Cleveland, Ohio, we have been given the opportunity of using a biophotometer for adaptation tests on factory employees at Port Sunlight.

TECHNIQUE

In the course of the early trials with the instrument two difficulties were encountered. The first—which was not due to any fault in the biophotometer—was a discrepancy noted between what have been called the "disappearance" and the "reappearance" readings. If, after the subject has recorded the *disappearance* of the centre spot, the pointer is rotated in the reverse direction and the subject asked to record the *reappearance* of the spot, the two readings are seldom found to agree; sometimes the second is lower, and sometimes it is higher, than the first. No reference is made to this point either in the manufacturers' literature or in the published work of biophotometer users; it is to be assumed, therefore, that disappearance readings only have been used; but as there is no reason for favouring either rather than the other, in the results here presented the average of both readings has been taken. The second difficulty was that of the illumination control, which was criticised by Palmer and Blumberg. While quite fine differences can be recorded at the "dim" end of the scale, at the "bright" end only crude approximations can be made. The relation between the dial settings on the resistance box and illumination is not linear but logarithmic, which in practice means that for successive equal increments of dial readings the corresponding illumination decrements are not equal but progressively smaller. This is a normal characteristic of a filament lamp undergoing constant rate of change of voltage.

A few figures taken from the dial-setting/illumination Conversion Table show what large differences exist:—

Range of illumination in millifoot-candles.				
2·9	to 2·6	(a diff. of 0·3) is covered by	1	dial division.
1·0	to 0·69	(„ „) „ „	4	„ divisions.
0·315	to 0·015	(„ „) „ „	32	„ „

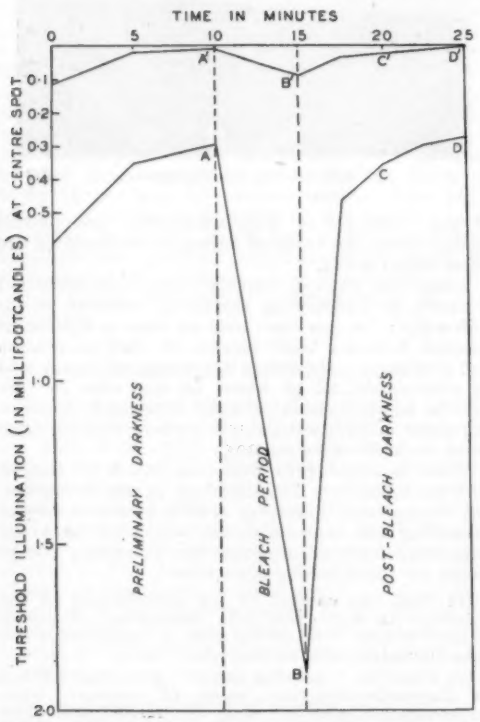

FIG. 2.—Ideal biophotometer curves. Upper curve = good adaptation. Lower curve = poor adaptation.

This defect is serious where hemeralopics are concerned, for most of their readings will be in the "bright" region where delicate or even moderately sensitive control is impossible; and it becomes serious for all subjects when the immediate post-bleach readings are attempted. At this point the readings are not only always in the "bright" region but they are improving markedly from second to second because of the rapidly rising visual acuity. The operator finds he has not the time to take careful readings at the very point where accuracy is of paramount importance.

In order to obviate this difficulty a novel technique was used; instead of taking immediate post-bleach readings at time intervals, the illumination of the centre spot was set at the same reading (0·76 millifoot-candles) and *the time in seconds taken to discern this spot* was recorded. This has been termed the "time value." Then, sixty seconds after the turnover from the bright light, a normal double reading was taken (except in those few cases where the subject took more than sixty seconds for discernment at 0·76 millifoot-candles), and then a final reading after five minutes, so that each complete test occupied twenty minutes.

OBSERVATIONS

A series of observations based on this new technique has been carried out on 80 young women and 22 men, all apparently normal and healthy at the time of testing. No person with defective vision was included. After an interval of seven days duplicate readings were made on 65 of these people. Between tests an arbitrarily chosen group of 34 was given 5000 I.U. of vitamin A each daily, in the form of capsules of a mammalian-liver oil concentrate.

An examination of the individual results (for considerations of space they are not reproduced here) revealed two outstanding points:—

(1) That the post-bleach readings were always related to the pre-bleach readings. This is also apparent in Jeghers's biophotometer graphs, and the implication is that the conditions experienced by the eye immediately before testing are not very important, and consequently that the test might be advantageously confined to a standard bleach followed by, say, ten minutes' darkness. In view of this it was thought justifiable to take the average of the two readings, one at the end of the first ten minutes' darkness, and the other at the end of the five minutes' post-bleach darkness, as an indication of adaptation comparable to that used by Jeghers; for this reason it is called throughout this paper the "Jeghers's index." As an example, the Jeghers's index of the subject represented by the curve in Fig. 2 would be the average of A′ (0·010) and C′ (0·022)—i.e., 0·016. Similarly that of the subject represented by the lower curve would be $[A\ (0{\cdot}29) + C\ (0{\cdot}35)]/_2 = 0{\cdot}32$.

(2) That in many case the time values were not correlatable with the Jeghers's indices, although if the

Jeghers's indices are graded into four groups the *average* time values for each group progressively improve (Fig. 3).

In consequence the distribution of the Jeghers's indices and the time values, together with their alteration after the subjects had taken vitamin A, were examined separately. The former varied from 0·0102 to 0·7720—but figures above 0·4000 must be

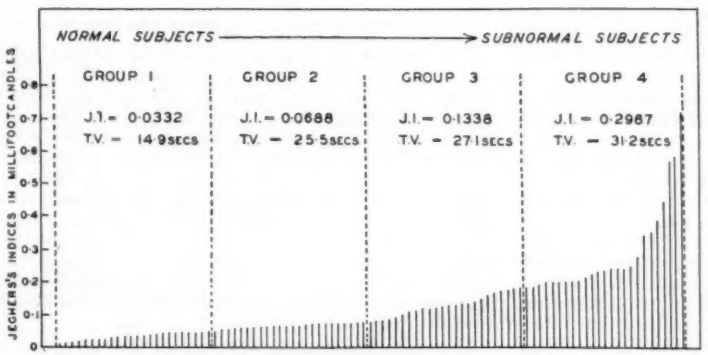

FIG. 3.—The 97 "Jeghers's indices" (J.I.) arranged in order and divided into four groups to show corresponding gradation of average "time values" (T.V.).

considered unreliable because of the experimental error discussed previously. For the purpose of analysis all those giving readings less than 0·0830 were classified as normal, and all those more than 0·1840 as subnormal. This gave 50 per cent. of the former and 28 per cent. of the latter. From these two groups all the duplicated readings were collected, divided into "controls" and "vitamins," and the figures averaged (Table I).

These figures are not very impressive; there is an improvement of the subnormals after taking vitamin A, but it is not very great; moreover many individual retests were discrepant.

The figures show the lack of sensitivity of the technique recommended by the makers of the instrument for short-period curative tests. There are

TABLE I

—		No. in group.	Jeghers's indices in mfc.'s.	
			Initially.	After 7 days.
Normals ..	Controls ..	13	0·0439	0·0597
	Vitamins ..	16	0·0602	0·0868
Subnormals	Controls ..	8	0·4093	0·4490
	Vitamins ..	12	0·2376	0·2019

indications, however, that the Jeghers's indices do respond to long-period therapy, from which it is concluded that the failure to give an immediate response may only be apparent—the real difficulty being the inaccuracy of the instrument where high illuminations are concerned.

The time values were treated similarly. The range was from 3½ secs. to 74 secs.; 46 per cent. gave values of 23 secs. or less, and 32 per cent. gave values of 30 secs. or more; these were made the normal and subnormal groups respectively (Table II).

It is evident from these figures that night-blindness and its response to vitamin-A medication can be measured in terms of time values. Incidentally the figures show that the "learning factor," at least for this type of reading, is insignificant. Whether this time value is of greater value than the more usual criteria for the assessment of dark-adaptation cannot be ascertained with the biophotometer in its present state, but it is very probably the best method of taking readings with the instrument. It has, too, the advantage of rapidity; each test need occupy only six minutes—five minutes' bleaching followed by a single discernment reading.

Work is being continued and we hope later to publish a more comprehensive report.

SUMMARY

The biophotometer, a new apparatus for the detection and quantitative assessment of hemeralopia, is described. Compactness, ease of manipulation, rigidly standardised testing conditions, and the use of physical units of illumination are noteworthy features. The instrument, which has been extolled by some American investigators and depreciated by others, has one serious, although reparable, defect—viz., an insufficiently sensitive device for controlling test illumination. In place of the prescribed technique, it has been found that to record the time taken by the eyes, immediately after exposure to a bright light, to discern a spot-source of light maintained at fixed illumination, provides

TABLE II

—		No. in group.	Time values in seconds.	
			Initially.	After 7 days.
Normals ..	Controls ..	12	14·4	12·1
	Vitamins ..	14	14·8	12·0
Subnormals	Controls ..	10	44·2	45·3
	Vitamins ..	12	44·1	23·8

a useful criterion of night-blindness and consequently of the adequacy of the vitamin-A supplies of the human body.

As the work here recorded is of a preliminary nature, and in view of the small number of subjects tested, no well-defined conclusions can be drawn. The evidence there is, however, suggests that about 30 per cent. of the people examined are vitamin-A deficient to an extent that is partially, but not fully, alleviated by the administration of 35,000 I.U. over a period of seven days.

We wish to express our gratitude to the directors of Messrs. Lever Brothers and Unilever Limited for permission to publish this work.

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MEDICINE AND THE LAW

Unlawful Restraint of Mental Defective

THERE is no need to tell Englishmen that their personal liberty is vindicated by the writ of habeas corpus. If they suffer from any unlawful imprisonment or detention, habeas corpus will give them justice. In the Court of Appeal last week the case of Rex *v.* Board of Control ex parte Winterflood showed this remedy available for a patient who had been detained by an order under the Mental Deficiency Act. He had, as a matter of fact, been released on licence, so that he could not be said to be detained; but the court declared his previous detention to have been unlawful.

Mr. Winterflood had been sent to an institution as a defective under an order which lasted for a year. The order had been continued for another year and again for a further period of five years. But there had been a gap between the date of expiration and the date of continuance. The original order which placed him under restraint for a year was made on June 11th, 1929. A continuance order (for another year) was made on June 23rd, 1930. A further continuance (for five years) was made on June 29th, 1931, purporting to continue the order till June 24th, 1936. On July 6th, 1936, yet another continuance order was made. Did the occurrence of these intervals between the dates of expiration and the dates of renewal invalidate the order? The answer depended on the terms of Section 11 of the Mental Deficiency Act. This section states that the original order will expire at the end of one year unless continued as the Act provides. It goes on to state that the order will remain in force for a further year, and thereafter for successive periods of five years, if, at the date when it would have expired and at the end of each period of one year or five years, the Board examines certain reports, considers that continuance is required in the patient's interests, and makes an order for the purpose. Mr. Winterflood contended that on June 29th, 1931, when one of the continuance orders was made, the previous order (running for a year from June 23rd, 1930) had already expired. Having ceased to have effect, it could not be continued. Consequently, he argued, on and after June 24th, 1930, the Board of Control had no authority to detain him. He asked the High Court to say that he had been unlawfully restrained for several years and to order his immediate release. The case came before the Divisional Court which found no reason for holding that the restraint was unlawful. He then went to the Court of Appeal where he made good his contention. Lord Justice Slesser observed that the language of Section 11 was unambiguous. The order could not be made for more than one year. The right time to make a continuance order was June 23rd, 1931. In the interval between June 23rd and June 29th Mr. Winterflood could have walked out of the institution in which he was detained and nobody could have pointed to any authority under which he could be kept inside the walls. Another point which caused the continuance order to be invalid was that, under Section 11, the Board had to satisfy itself that the continuance was required in the patient's interests before it ordered the continuance; the commissioner had not come to his decision on this point till July 7th, 1931. Mr. Justice Goddard, who concurred, said it might be desirable that mental defectives should be kept in detention after the expiration of an order until a further order was made. But, if so, Parliament must amend the Act; the judges could not override the law. The courts, he added, had always been jealous of the liberty of the subject and had taken a strict and technical view of those cases where persons had been kept in confinement against their will. So now, it seems, the Board of Control must keep an exact time-table of all persons affected by restraint orders and must be careful to see that an order is renewed, if continuance is required, before it expires.

An Inconclusive Medical Certificate

Two points of possible medico-legal interest arise out of Mr. Justice Langton's judgment in the divorce proceedings in Thompson *v.* Thompson, King's Proctor showing cause. One is the uncomfortable suggestion that a report by two gynæcologists upon the condition of a woman named in the proceedings was worthless because she had been impersonated by some other woman at the medical examination. The judge came to the conclusion that so deliberate and daring a fraud upon the court had not been committed. The allegation, however, may make members of the medical profession wonder whether the arrangements for such examinations are entirely proof against a conspiracy to defeat the ends of justice.

The second point was the judge's reminder that a medical finding that a woman is *virgo intacta* is not a final answer to an accusation of adultery. Proof of virginity puts a heavy burden on the party charging a woman with having committed misconduct. But there may be partial intercourse which is sufficient to sustain the charge. If the court is satisfied by other evidence, the medical certificate will not stand in the way. In the Thompson case the judge made a careful statement of the evidence which weighed with him. Amongst other things he was impressed by the fact that the respondent, though not related to the woman and having no business ties or acquaintance with her, possessed a latchkey to her flat. A long-continued association, in circumstances of a highly compromising character, rendered doubly suspicious by the parties' ineffectual denials, was allowed to outweigh what the judge called "the guarded but precise medical certificate." The parties were admittedly on terms of deep affection, slept in the same room together in one house, and almost certainly, he said, slept in the same bed in another house, and they had been at great pains to deceive both the world and the court as to their behaviour. He found that there had been mutual intercourse amounting to adultery in law, in spite of the medical certificate and in spite of the strong presumption in favour of the woman's innocence which the certificate would normally create.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

WATER, MILK, AND AIR

THE drinking water here is as good as that of any other city in the world according to Dr. Ladislaus Dabis, director of the Public Health and Bacteriological Institute. During 1937 a total of 88,000 samples of water, food, and air have been tested in its various laboratories. Tests have shown that the filtering installation is bacteriologically beyond reproach. Less favourable conditions, however, were found in the suburbs and in the adjacent villages, where there are plenty of wells that are open and insufficiently cared for. The water from these con-

tained much colon and other bacteria. Still less satisfactory were the reports on the cleanliness of swimming-pools, where the ever-increasing sport renders a rigorous control of hygiene necessary. The bacteriology of the "ice lakes," ice from which is stored for summer use, leaves much to be desired, for they have been found to be seriously contaminated. An order was consequently given that this lake ice must not be used in future, and only that prepared artificially is now allowed. Bottled waters, on the other hand, were found to be very good. The institute took 480 specimens of Danube water. While above the city the number of micro-organisms on either bank is low, below they are naturally much more plentiful and in some parts of the river the water contains 1,440,000 bacteria per c.cm. The daily consumption in Budapest is some 45 gallons a head. The food bacteriological tests were chiefly concerned with the control of milk. It was found that 56·2 per cent. of the pasteurised and 56·7 per cent. of the raw milk was unobjectionable, but only 12 per cent. of raw cream and 55 per cent. pasteurised cream could be called high grade. There was a great improvement in ice-cream; as against 29·8 per cent. of first-class samples in 1936, the figure last year was 54·3. The institute examines all the 14 dairies operating in the capital. Out of these only 6 were found to be unobjectionable and as a rule pasteurisation was grossly imperfect.

The air in the city still has a high gas and sulphur content. In consequence of import restriction there is a shortage in foreign coal and the inferior local coke and coal is used both in factories and in private households. There is still a large amount of dust, but the energetic campaign against this evil—e.g., rebuilding of the roads and increased watering—will certainly bring about a great improvement.

HOSPITAL CONDITIONS IN POLAND

At present there are 700 hospitals in the Polish republic. Of these only 43 are maintained by the State; 313 are supported by municipalities, towns, and villages, 234 by unions, associations, and insurances, and 110 by private persons. The total number of hospital beds amounts to 56,830, out of which 11 per cent. are in the State hospitals, 48 per cent. in the community, 35 per cent. in the association, and 6 per cent. in the private institutions. The Ministry of Social Welfare urges further hospitals to be built, their view being that the proportion of beds to population must be at least 5 per 1000 in the towns and 2 per 1000 in rural districts. The population of Poland, according to the 1931 census, is 31,927,773; out of these 8,679,979 are urban and 23,247,794 are rural inhabitants. Thus there ought to be 43,400 beds for town-dwellers and 46,496 for the country. More than 33,000 beds are therefore needed. For the time being Warsaw alone has the full quota of hospital accommodation, and the counties of Slaski, Posnan, and Cracow have 90 per cent. The rest of the towns and counties have only 10–50 per cent. Conditions are worse in Stanislawow and Tarnopol and in the Eastern counties.

ACTION OF ACETONE ON CANCER CELLS

A young Hungarian physician, Dr. Desider Barna, has made extensive experiments at Prof. Louis Bakay's surgical clinic in studying the division of cancer cells. He fully endorses Haberlandt's conception that in the division of normal cells a hormone plays the principal part, and that it is formed in the dividing cells themselves, being secreted by the chromosomes. He believes that besides the Haberlandt hormone there must be another that inhibits its action, and it is through these hormones that the endocrine glands regulate cell division. At present this inhibiting hormone is unknown, but Barna calls it mitofrenin. Believing that acetone might destroy the cancer cells, he has tested its action on experimental animals. The results, he claims, were very satisfactory, but though the tumours rapidly regressed in every case, the experimental animals themselves died within a short time, also without exception. Barna learnt enough, however, to conclude that cancer cells are more sensitive to the action of acetone than are other cells, and he is conducting further experiments with chemical drugs.

WINE AND THE DEATH-RATE

The consumption of wine in Hungary varies very closely with the death-rate. This is borne out by figures during the five years 1931–35 of men in the age-group 30–59—the period most exposed to the dangers of alcoholic excess. The decrease of wine consumption ran parallel with the decrease of mortality. As shown by the hospital reports, deaths due to chronic alcoholism—cirrhosis, paralysis, circulatory changes—were also decidedly fewer. In years with an especially abundant wine crop, as in 1922–24, the death-rate for that age-group was 12·69 per 1000, while in the next three seasons, when there was a very poor wine harvest, it fell to 9·93 per 1000.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

THE CONTROL OF CANCER

THE twenty-fifth anniversary of the American Society for the Control of Cancer was celebrated at a dinner on March 25th, held at the Ambassador Hotel in New York under the presidency of Dr. C. C. Little. The principal speaker was Dr. James Ewing, director of Memorial Hospital, who outlined for the society a seven-point programme as follows:

1. Wider adoption of periodic physical examinations specifically designed for the detection of cancer.
2. Campaigns directed against specific types of cancer to end the misconception of cancer as a single disease.
3. Scientific, quiet methods of educating the public rather than emotional or vaguely allegorical approaches.
4. Greater emphasis on the different cure rates in the different stages of cancer, showing that delay of even a few weeks may mean the difference between cure and fatal ending.
5. New ways of reaching the non-reading masses.
6. More emphasis on prevention, particularly in internal cancers.
7. A skillfully compiled readable book on cancer for the layman.

Dr. Ewing criticised the modern slogan that cancer is curable. This is true, he said, of only 35 per cent. of the 150,000 who fall ill of cancer each year in this country. Facilities for the early detection of internal cancers are not available. He recommended that the public should be made to realise how variable is the prognosis in different types and stages of the disease and how great is the penalty for delay.

The dinner was followed by a programme broadcast over the "blue network" of the National Broadcasting Company. This included addresses by Surgeon General Thomas Parran, who spoke from Washington, and by Dr. Anna C. Palmer, who was cured of cancer of the breast in 1920 and who is president of the newly formed Cured Cancer Club.

PRESIDENT SUMMONS HEALTH CONFERENCE

President Roosevelt has written to Miss Josephine Roche, who, though she has resigned as assistant secretary of the Treasury, continues to act as chairman of the Interdepartmental Committee to Co-ordinate Health and Welfare Activities. The President suggests that this committee "give consideration to the desirability of inviting at some appropriate time representatives of the interested public and of the medical and other professions to examine the health problems in all their major aspects, and to discuss ways and means for dealing with these problems." It is understood that Miss Roche plans to include in the invitations representatives of agriculture and of industry as well as of the professions.

SEXUAL ASSAULTS

Last autumn the newspapers took a sudden unusual interest in offences to public safety and morals by persons suffering from sexual abnormalities. The resulting public outcry furnished the stimulus for a series of papers at the twenty-eighth annual meeting of the National Committee for Mental Hygiene. Dr. Edward A. Strecker, professor of psychiatry at the University of Pennsylvania, related that one of the arguments advanced by the Arabs in favour of marriage between first cousins is that in case of a quarrel neither mate will find it expedient to curse the other's ancestors—he would too obviously be cursing his own! The line of demarcation between normal and abnormal in sex is so faint that we shall be wise not to curse too hastily the sex offender. And yet last fall so intolerant was public opinion, stirred by the newspaper headlines, that, in the words of Mr. A. H. McCormick, New York City's Commissioner of Corrections, "it was utterly unsafe to speak to a child on the street unless one was well dressed and well known in the neighbourhood. To try to help a lost child, with tears streaming down its face, to find its way home, would, in some neighbourhoods, cause a mob to form and violence to be threatened." Mr. McCormick believes that sex offenders are mental patients in need of hospitalisation, but there are no hospital facilities available to them in New York City. He therefore does the best that can be done with the penitentiary facilities at Riker's Island. Here some 18,000 sentenced prisoners are received annually of whom about 500 are sentenced for sex offences. The 1938 budget has provided for a psychiatrist and two senior psychologists. "What we can accomplish remains to be seen," he says. "It is one thing to diagnose and another to treat." While New York is lacking in professional advice a nearby State (unnamed) is failing to use the advice that has been made available. Dr. Winifred Overholser, superintendent of St. Elizabeth's Hospital, Washington, D.C., reported that in this State the judge of any court, civil or criminal, may request the department of mental diseases to examine "any person coming before the court," such an examination being made without charge. "Yet in a recent year, when 173,000 criminal cases were started in the district courts and over 37,000 in the superior courts, only 34 requests for examination were addressed to the department."

STUDY OF MEDICAL CARE

I have now seen the eight questionnaire forms distributed to county medical societies by the American Medical Association. Each is entitled "Study of need and supply of medical care." If the words "need and" was omitted the title would be accurate. Each form inquires into a separate source of supply: the private physician's supply, that of the hospital, of the nursing organisations, of the health department, and so on. So much detailed information is called for that, taking into account the very variable enthusiasm and competence of the investigators and the great variation of the types of provision of care in different parts of the country, it is difficult to believe that this well-meant effort will produce statistics of value. At any rate the statistics produced can only measure the present provision of medical care. The inquiry takes no account of those who do not seek medical care. The great bulk of those who need medical care do not seek it either because they do not know where to seek it, or because it is not available to them, or because they are not themselves cognisant of need. No one can enumerate these individuals. Their number can be estimated best by such house-to-house canvassers as that conducted by W.P.A. workers in the recent nation-wide survey.

THROMBOCYTOPENIA

Observations by C. E. Troland and F. C. Lee, published in the *Bulletin of the Johns Hopkins Hospital* for January, establish a scientific basis for splenectomy in persistent thrombocytopenia and open the way to new studies which may abolish the use of the term "idiopathic" in such cases. They found that a substance contained in the spleens from cases of thrombocytopenic purpura had the property of reducing the platelet count in the circulating blood of normal rabbits by as much as 90 per cent. The as yet chemically unidentified substance for which the authors suggest the term "thrombocytopen" was obtained from three cases. When 20 c.cm. of the extract obtained from the first case was injected into the ear vein of a rabbit the platelet count was reduced in twenty-four hours from 620,000 per c.mm. of blood to 58,000, with return to normal in thirty-six hours, and bleeding-time was prolonged at the height of the reduction in platelets. The extract from the second case produced a platelet drop from 640,000 to 20,000 in twenty-four hours, and from the third from 610,000 to 100,000 in the same length of time. These results were noted from the injection of 20 c.cm., but it was found later that 5 or even 3 c.cm. would produce almost as much thrombocytopenia as the larger amounts. Repeated injections caused a constant count of about 70,000 for about nine days, while continued administration (there were only about four injections given) might have maintained this low count longer.

The method of preparation was as follows. The spleens were taken directly from the operating-room, ground in a food-chopper, and placed in a rubber-sealed jar with twice the volume of reagent acetone. The jar was shaken occasionally for several days, and after about two weeks the supernatant fluid was filtered away, the acetone distilled off, and 100 c.cm. of distilled water added to the small amount of thick brownish material which had been deposited on the walls of the distilling flask. This was shaken vigorously. It was noted that the filtrate, yellowish-brown and cloudy, did not show a precipitate after standing in the ice-box for weeks. Four control extracts were made in a similar manner from thyroid tissue, myomatous uterus, a spleen from a patient with Banti's disease, and a spleen from a case of hæmolytic jaundice. Virtually no decrease in the number of platelets was noted after the injection of any of these control extracts.

IRELAND

(FROM OUR OWN CORRESPONDENT)

SUGGESTED WHOLE-TIME DISPENSARY MEDICAL SERVICE

EVER since the establishment of the dispensary service in Ireland in the middle of the last century the service has been carried on by part-time medical officers. In country areas it would have been impossible to carry it on otherwise. The expenses of salaries on a whole-time basis would have been greater than the ratepayers would have tolerated, and, on the other hand, if the dispensary medical officers had been debarred from private practice the public, apart from those entitled to free medical attendance, would have been deprived of access to any medical practitioner. In the larger cities the case has been otherwise. There has been no scarcity of private practitioners, and in present-day conditions the dispensary officers are so overworked that they have little time to spare from their official duties to devote to private practice. The remedy would be to appoint a larger number of dispensary doctors. It has been found, both in town and country, that the stimulus of the prospect of private practice has attracted men to the dispensary service who would not otherwise have sought it. Moreover, the reputation gained by a medical man in his public duties has often formed the foundation of a sound private practice. The dispensary medical officers of some of the larger centres of population have recently been disturbed by rumours that they are to be displaced in order to establish a whole-time service in such areas. Both in Dublin and Cork such proposals have been put forward by members of the local authorities, but so far have not gained any substantial support. It is stated, however, on apparently good authority, that the commissioner in charge of local affairs in Limerick is about to abolish the several dispensary districts in his area, terminating the terms of office of the medical officers, and to appoint a small number of whole-time officers in their place. Moreover, it is stated that his proposals are likely to be approved by the Department of Local Government and Public Health. Medical opinion is certainly hostile to such a development. It is held that a limited whole-time medical service in a small area is not likely to attract a suitable class of candidates. It would offer no prospects of promotion and no outlet, and so far from being a useful training for private practice the routine work would be detrimental to the development of capacity for private practice. The work would be exacting in time and labour, and would leave no leisure for self-improvement. In fact, one could hardly expect that the posts would attract any but quite young men devoid of ambition but compelled by poverty. If, as many medical men consider, the poor-law medical service should be replaced by a State service, it should be done on a definite comprehensive plan and not piecemeal. Moreover, most of those who have advocated a State medical service for Ireland have contemplated a part-time and not a whole-time service.

CHIEF VETERINARY OFFICER.—Mr. D. A. E. Cabot, senior deputy chief veterinary officer, has been appointed to be chief veterinary officer in succession to Sir John Kelland, who retires on June 1st.

RESEARCH IN SURGERY AT EDINBURGH

A UNIT for clinical research in surgery has been established at Edinburgh by the Medical Research Council, acting jointly with the Royal Infirmary, the University, and the Royal Hospital for Sick Children. The unit will be located in the infirmary, with facilities also in the university department of surgery and at the hospital. The director is Mr. W. C. Wilson, F.R.C.S.E., who has for this purpose been appointed to the whole-time staff of the council. The arrangement has at present been made for a period of five years, from April 1st, 1938.

Mr. Wilson graduated in medicine at the University of Edinburgh in 1924, and three years later became a fellow of the Royal College of Surgeons of Edinburgh. He held a Carnegie research fellowship at the university and later was awarded a Rockefeller travelling fellowship. After a period as assistant surgeon at the Deaconess Hospital, Edinburgh, he was appointed to the staff of the Royal Hospital for Sick Children, first as assistant surgeon and later as surgeon. At the university Mr. Wilson is at present lecturer in applied physiology and child life and health. In 1929 the Medical Research Council published his report on the tannic acid treatment of burns in their special report series, and in 1933 he was one of the committee who reported to the Mines Department on the medical treatment of men burned in colliery explosions. He has also written on the occlusion of blood-vessels and on sweat secretion.

The establishment of "units" or departments of this kind in selected hospitals forms part of a policy adopted by the Medical Research Council for the promotion of research work in clinical science, as opposed to the laboratory branches of medicine. Two units for research in clinical medicine, and one for research in neurology, have already been established in London. The new surgical unit is the first one under the scheme to be set up outside the metropolis.

THE LANCET 100 YEARS AGO

April 14th, 1838, *p.* 74.

From a lecture on fermentation delivered by Dr. G. G. SIGMOND *at the Windmill-street school of medicine.*

. . . Jem Sheed, the founder of Persepolis, has, amongst the antiquarians, now carried away the honour of being considered the inventor of wine. The Persian writers say, that being fond of the grape he was desirous of preserving some of a fine quality, and that he ordered them to be placed in a vault, in a large vessel, for future use; in this situation the process of fermentation went forward, but their juice having been tasted was found immature, and supposed to be poisonous, and the word poison was accordingly affixed upon the vessel containing it. His favourite sultana was affected with a nervous headache which so overpowered her that she determined on suicide, and for this purpose swallowed some of the suspected liquid; she drank so much of this, which had now become wine, that after undergoing some pleasing sensations from its effects, she fell asleep, and was so much satisfied with the experiment that she had made, that she had recourse to this remedy until the whole of the poison was drank. The monarch, however, from some circumstances, was led to make inquiries, and the lady having confessed what she had done, taught him to follow her example upon another occasion; the whole court was delighted with the experiment, and to this day Tehere Kooshon, the delightful poison, is as much sought after as it is elsewhere.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

III

Mr. Somerset Maugham recently wrote "I do not know a better training for a writer than to spend some years in the medical profession" and added of his hospital experiences "Here I was in contact with what I most wanted, life in the raw." There is truth in this, and I think that despite everything we are left with a more favourable impression of human nature than, say, the lawyer or the stock-broker. In his "Summing Up" Mr. Maugham states: "I have no desire to lay bare my heart and I put limits to the intimacy that I wish the reader to enter upon with me." Therein he differs from Sir James Barrie, whose autobiographical "Greenwood Hat" is almost shy-making in its self-revelation. I know that this attitude revolts some readers, but there is much of medico-psychological interest to be gathered from it. Thus he told us he was naturally left-handed but learned to write with his right, until he contracted writer's cramp and had to educate his left hand. He went on to say "I write things with the left, or to put the matter I think more correctly, it writes things with me, that the right would have expressed more humanely. I never, so far as I can remember, wrote uncomfortable tales like 'Dear Brutus' and 'Mary Rose' till I crossed over to my other hand. I could not have written these, as they are, with my right hand any more than I could have written 'Quality Street' with my left." Evidently his readers are much indebted to his writer's cramp! Now some authorities regard this disability as a revolt of the unconscious. I saw a patient whose cramp first developed over writing cheques for his wife, a process he had good cause to dislike cordially. Barrie's right hand perhaps refused to go on "writing with him" things which were plastered over with a deliberate sentimentality and not true to his deeper self. Being congenitally left-handed he acquired the power of writing that way late in life with comparative ease, and a rich outpouring from the unconscious was released through the more primitive route. For to me the chief attraction of Barrie's work is the frequent employment of primitive imagery. Many primitive races regard a man's shadow as his soul; Peter Pan was distressed at losing his shadow, and it was his mother-substitute Wendy who restored it to him. The symbolic significance of the taking away of the knife by the ghost of Mary Rose from her son is abundantly clear. Mr. Bosanquet has suggested that the tendency of boys at a certain age to build shelters in trees is a reversion to the arboreal state of men; Peter Pan places the Wendy House on the tree tops in Kensington Gardens. Mary Rose hid in the apple tree, her son escaped from home by it, her father cut it down; here again the symbolism is clear for that apple tree first appeared in the human drama in the Garden of Eden.

I only met Barrie once; he was pleased that my wife had divined that Lob was Peter Pan grown old. Otherwise conversation languished, though not so completely as on the occasion when he sat next to A. E. Housman at dinner and they never exchanged a word. He told me they exchanged letters next day however.

Barrie wrote:—

> Dear Professor Houseman,
> I am sorry about last night, when I sat next to you and did not say a word. You must have thought I was a very rude man; I am really a very shy man.
> Sincerely yours,
> J. M. Barrie.

Swiftly came the reply:—

> Dear Sir James Barrie,
> I am sorry about last night, when I sat next to you and did not say a word. You must have thought I was a very rude man; I am really a very shy man.
> Sincerely yours,
> A. E. Housman.
>
> PS.—And now you've made it worse for you have spelt my name wrong.

* * *

Housman was indeed an enigmatic and somewhat alarming figure. He seemed to hate any reference to "The Shropshire Lad" and preferred to base his claim to fame on the skill with which he brought all the heavy artillery of scholarship to bear on his edition of Manilius, a poet who otherwise would have been deservedly forgotten. Authors are often extraordinarily incapable of appreciating their earlier work in their later life. George Moore told me that he was spending his old age pulling up weeds, by which he meant that he was drastically revising the novels he had written more than thirty years before. I ventured to suggest to him that he was pulling up some flowers as well, since he had expunged from the final version all the passages I remembered best in "Evelyn Innes." To which he replied that it was a rotten book anyhow! Well, perhaps as the flame of life dies down, some of the imaginative fire which inspired the author as a young man does seem frankly ridiculous to him. What a pother about nothing, he thinks—but style, now *that* remains; *that* is worth striving for. And so he flattens out his story, until the monotonous perfection of his "style" spreads over it like the delta of a river approaching its end. How different from the torrent that poured out all sparkling at its source.

* * *

For those who dislike Barrie's sentimental attitude towards his childhood, Frank Kendon's "The Small Years" will be found refreshing. How true is his remark "The people who lived round about us were all part of the spectacle of life, . . . and during the long eternity of childhood they seemed to remain unchanged." And then one of them dies and the old sense of permanence, of security is gone for ever. He says of his grandfather's death "He was as a sun in the little world we knew, and I could not see a world at all without him."

Particularly striking is his description of the way that the contrast between life and death became real and tragic through the killing of a wren by throwing a stone at it. "Its eyes were shut, its beak was caught in the act of crying, death took it in the middle of a breath; and certainly it was dead—still, small, harmless—and brotherly we suddenly saw. There was a pain at the back of my mind, as though something shameful had been done."

I once told this story to a group of three men—one a canon, the second a judge, the third a solicitor.

Each of them remembered a similar incident in their own boyhood; so did I. The fact that such an incident should have impressed itself on the mind of each of us all those years after is in itself significant. Pointless cruelty may up to a certain stage be merely the thoughtless expression of primitive savagery—an atavistic throwback. But once it is felt to be wrong, a decisive moment in a boy's life has been reached, and much depends on the way he reacts to it. If he persists in such actions after this flash of illumination, the vestigial savage is on the way to become a potential sadist. It is of great importance to the future of mankind that the tendency of this strain of savage enjoyment of cruelty to persist should be realised. It was strikingly demonstrated in the reaction to the sentences inflicted in a recent case. Whether the true ends of justice are served by corporal punishment or not is a debatable matter, but the eagerness with which two entirely different accounts of that punishment were read in the columns of two newspapers under the same proprietorship showed that on the public the effect was undoubtedly evil.

CORRESPONDENCE

THE HÆMOLYTIC SYNDROMES

To the Editor of THE LANCET

SIR,—The excellent editorial in your issue of Feb. 26th refers to our work on "the presence of hemolysins in acute hemolytic anæmia" [1] and to other papers relating to varied phases of the problem. The immediate occasion for your article was the appearance in the same issue of a contribution by Dacie, Israëls, and Wilkinson on paroxysmal nocturnal hæmoglobinuria of the Marchiafava type. May we be allowed a few words of comment regarding our views on the hæmolytic syndromes and their interrelationships?

Our recent interest in the subject of the hæmolytic syndromes arose from the demonstration of very active isohæmolysins in 3 cases of acute hæmolytic anæmia. These hæmolysins were active in a wide temperature range, but their activity could be suppressed by heat (56° C.) and by previous mixture with normal human serum. Cells of all blood groups, including those of Group O, were hæmolysed. Addition of complement resulted in reactivation of heat-inactivated serum. Contrary to your editorial statement in this regard, the effects of changes in *p*H were not studied. The fact that normal human serum could inactivate hæmolysis in vitro caused us to speculate regarding a possible antilysin present in normal serum, thus accounting for the efficacy of the transfusion of even a small quantity of blood in some of the clinical cases. Josephs,[2] as you point out, demonstrated that normal serum possessed an inhibitory power upon hæmolytic activity and used serum concentrates in certain cases of hæmolytic anæmia.

On the basis of our studies with clinical material, together with our more recent experimental work, we are rapidly coming to feel that all of the hæmolytic syndromes, of which there are many, are due to the activity of hæmolysins, whether or not these are demonstrable in the blood-serum. As pointed out by Chauffard and Vincent many years ago (1909) and neglected by most observers, the difference between acute hæmoglobinuria and acute hæmolytic anæmia (icterus) is one of degree and probably a function of the amount of hæmolysin present. Our discovery of an hæmolysin was in reality a rediscovery (the literature abounds with them), since Chauffard with Troisier [3] and Chauffard and Vincent [4] found similar hæmolysins in their cases and proposed the term "hæmolysinic icterus." Much of the work of Widal, Abrami, and Brulé [5] on acquired hæmolytic icterus also seems to have been forgotten. At present we classify the hæmolytic syndromes in this fashion:—

Fulminating.—Acute paroxysmal hæmoglobinuria—"cold type" (Donath-Landsteiner).
Paroxysmal nocturnal hæmoglobinuria.

Acute.—Acute hæmolytic anæmia (or icterus)—often associated with hæmoglobinuria.
Subacute hæmolytic anæmia (same as acquired hæmolytic icterus, hæmolytic splenomegaly—Banti [6]).

Chronic.—Acquired type.
Congenital type.

Since hæmoglobinuria may occur when hæmolysis is unusually rapid, a number of cases of acute hæmolytic anæmia have been classified under the hæmoglobinurias, as for example that of Chauffard and Vincent (1909) [4] and Castex, Steingart, and Poletti (1932).[7] One of these (Chauffard and Vincent) has been quoted by Dacie et al. as belonging in the group of paroxysmal nocturnal hæmoglobinuria. They state that the only serological finding in Chauffard and Vincent's case was "slight autolysis in venous blood." This is contrary to the actual data which show that Chauffard and Vincent made extensive studies of the serum hæmolysins and demonstrated their complete identity with the lysins which were then under intensive study by various immunologists (Bordet, Ehrlich, and Morgenroth, and others). The case of Salén,[8] which is quoted by Dacie et al., does not appear to be of the nocturnal variety, and since hæmoglobinuria occurred chiefly with cold, it more closely resembled the paroxysmal (cold) type.

Donath and Landsteiner [9] demonstrated that certain cases of paroxysmal hæmoglobinuria were associated with the presence of a lysin active only at low temperatures. Our own lysin is active at various temperatures and is relatively thermostabile. The lysin demonstrated in the case of Dacie et al. is thermolabile and is affected greatly by changes in *p*H, as also pointed out by Ham.[10] These two groups of investigators conclude that the disorder of paroxysmal nocturnal hæmoglobinuria resides in an abnormality of the cells. It is possible, however, that the abnormality of the cells is conditioned by the activity of a lysin which might have caused the cells to become "sensitised" and thus more readily susceptible to hæmolysis. Some of the discrepancies alluded to by Dacie et al. might be due to activity of lysin rather than to cellular abnormality. It is possible that various types of hæmolysins are present in various clinical conditions, and already four have been demonstrated: acute paroxysmal ("cold") hæmoglobinuria, associated with a "cold" hæmolysin; paroxysmal nocturnal hæmoglobinuria (heat-

[1] Dameshek, W., and Schwartz, S. O., *New Engl. J. Med.* 1938, **218**, 75.
[2] Josephs, H. W., *Bull. Johns Hopk. Hosp.* 1938, **62**, 25, 53.
[3] Chauffard, A., and Troisier, J., *Bull. Soc. méd. Hôp. Paris*, 1908, **26**, 94.
[4] Chauffard, A., and Vincent, C., *Sem. méd.* 1909, **29**, 601.
[5] Widal, F., Abrami, P., and Brulé, M., *Arch. Mal. Cœur*, 1908, **1**, 193.
[6] Banti, G., *Sem. méd.* 1913, **33**, 313.
[7] Castex, M. R., Steingart, M., and Poletti, R., *Sang*, 1932, **6**, 589.
[8] Salén, E. B., *Acta med. scand.* 1927, **66**, 566; 1935, **86**, 570.
[9] Donath, J., and Landsteiner, K., *Münch. med. Wschr.* 1902, **51**, 1590.
[10] Ham, T. H., *New Engl. J. Med.* 1937, **217**, 915.

labile, *p*H-labile hæmolysin); paroxysmal hæmoglobinuria, Salén (thermostabile ? "cold" hæmolysin, complement not required); acute hæmolytic anæmia (hæmolysin thermostabile, complement required).

In two of our cases of acute hæmolytic anæmia, the blood picture superficially resembled that of pernicious anæmia; in the third one, the outstanding features were microspherocytosis and increased fragility, as in congenital hæmolytic jaundice. We felt that the abnormal blood picture might be due to the hæmolysin, since with recovery and gradual disappearance of hæmolysin the blood picture became normal. Our experimental studies with acute hæmolytic anæmia bear out our original conception that microspherocytosis and increased fragility may be due to the activity of a hæmolytic agent rather than to a fundamental abnormality of cellular production in the marrow.

We feel that the result of all this recent work, as quoted by THE LANCET, has been to reopen the entire subject of the hæmolytic syndromes. These were rather thoroughly explored by the French between 1900 and 1914, and later by the Italians. From 1926 to the present, the investigations in pernicious anæmia and more recently in hypochromic anæmia became so absorbing, however, that the hæmolytic syndromes were almost forgotten. May THE LANCET continue to record the forthcoming advances.

We are, Sir, yours faithfully,

WILLIAM DAMESHEK,
STEVEN O. SCHWARTZ.

Boston, Massachusetts, March 24th.

OXYGEN-WANT AND ITS ALLEVIATION

To the Editor of THE LANCET

SIR,—Although a large proportion of patients obtain relief from oxygen-want by means of oxygen and carbon dioxide therapy there is still much room for improvement. This leads to the consideration of other means of relief—for example, whether there may be some substance or enzyme which could be administered to aid oxidation in the cells when these are exposed to oxygen pressures lower than the normal.

During the past six months I have directed attention to the search for such a substance. I have tested, *in vivo*, most of the usual hormones, vitamins, and drugs, including cardiac stimulants. None of these seem to give any very definite aid during exposure to severe degrees of acute oxygen-want. The experiments have been carried out in a small decompression chamber at the premises of Messrs. Siebe, Gorman and Co., S.E.1, to whom I am indebted for facilities. White rats weighing about 80–100 g. have been exposed fairly suddenly to barometric pressure 250 mm. Hg, or one third of the normal (oxygen pressure about 7 per cent. atmosphere), for about 35 minutes. When the surrounding temperature is kept at 24° C. all the rats usually survive the exposure and these conditions are used to test for substances which enhance oxygen-want. When the surrounding temperature is raised to 33° C. the rats cannot as a rule tolerate such a degree of oxygen-want for more than about 10 minutes. These conditions are therefore used to test for substances which increase powers of resistance to low oxygen pressure.

So far the only condition which enables white rats to tolerate 7 per cent. of oxygen for 30 minutes at 33° C. and survive is previous feeding for 3–5 days on a diet consisting wholly of raw carrots. The active substance is not vitamin A; nor does it appear to be carbohydrate since rats fed on a grain diet are not resistant. Starvation for a day or two has no relieving effect, and the usual means recommended to antagonise tissue oxygen-want—namely, ammonium chloride and carbon dioxide—are of little value under the above conditions compared with the diet of carrots. Experiments are in hand to isolate any active substance which may be present and act as a detoxicating agent for the liver, heart, brain, and other organs, or which may be of the nature of a peroxidase or other enzyme.

I am, Sir, yours faithfully,

J. ARGYLL CAMPBELL.

National Institute for Medical Research, N.W., April 6th.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—Neither of your correspondents has made any allusion to two points of importance that must be taken into consideration when advising any form of hearing-aid to a patient. One concerns a necessary precaution connected with its use, the other with its source.

The permanent use of an aid slowly but surely increases the deafness, because every aid acts by collecting, carrying, and magnifying sounds. This causes the ears to become "lazy," and the important listening function is thus thrown into abeyance. Consequently a time comes when the patient finds himself obliged to obtain stronger aids. Indeed, one French writer has envisaged a patient finally going about accompanied by a wheel-barrow full of batteries. As a consequence of this impairment of the listening function, it is imperative to prevent it by insisting that all patients using aids should carry out twice daily some form of listening exercise. Such exercises are comparable with voluntary movements during the recovery of a limb which is already receiving passive exercises.

My second point is that it is the duty of the aurist to ensure that his patient goes to an honest firm for his aid. Some surgical instrument makers now have special departments under competent experts for hearing-aids. These coöperate loyally with the surgeon and do not charge extra fees for trial. There are, on the other hand, certain commercial firms who advertise continuously and flamboyantly in the daily press and whose sole object is to exploit the deaf public for all it is worth. Their prices are exorbitant and they charge fees for trial which are not allowed for when a purchase is made. These firms do not worry about decibels, possibly because they have not yet heard of them.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., April 9th.

"OUR COLLEAGUES IN AUSTRIA"

To the Editor of THE LANCET

SIR,—I should like to express most heartily my agreement with the common-sense protest made by Mr. Goodwin and Dr. Endean against the policy of encouraging Jewish emigrés from Middle Europe to practise in this country. The medical profession is now very overcrowded and often for one vacant appointment there may be as many as thirty candidates, all of whom may be excellent men who would fill the job admirably. Under such circumstances how can it ever be "conclusively shown" (Prof. Samson Wright) "that the applicant's (for permission to practise) special knowledge and experience would be of benefit to the profession as a whole?" It might be pertinent to inquire whether other pro-

fessions are suggesting the same policy, and whether lawyers, engineers, civil servants, and so forth in this country are welcoming fresh competition in the shape of Jewish refugees from Middle Europe; or is ours the only profession encouraging this misplaced philanthropy?

I am, Sir, yours faithfully,

Cardiff, April 9th. A. C. LYSAGHT.

To the Editor of THE LANCET

SIR,—I, like those others who have written to you, feel the strongest possible sympathy for those who have been forced to leave Austria for racial or political reasons and would like to see them safely installed where they are unlikely to be subjected to further persecution. Nevertheless I cannot agree that we should have a further number allowed to settle in England—even if they are not admitted to the Register. These people are, in most cases, not of independent means and sooner or later they are going to ask to be allowed to practise. There is no doubt that our profession is greatly overcrowded now, and, even in some years, to allow a further number of doctors to practise in England will inevitably lead to hardship. If this occurs it will undoubtedly breed further antisemiticism in England as it has in Arabia.

It may be said that by giving the refugees research grants it is possible for them to do work which is beneficial without interfering with those already established here. This I do not think is true. At the time when the Jewish doctors were first ejected from Germany I was applying for research grants and found it impossible to obtain one. Shortly afterward I found that a large number—I believe eleven—German refugees had research grants in a hospital which I visited. It does not embitter me that I should have made a sacrifice of a grant which I may have obtained otherwise to aid some poor refugee, but I feel that we should not be the only country to make sacrifices. It is not surprising to me that those who signed the original letter to you were all established and need not fear "foreign" competition.

Are there no countries which have a large population but relatively few doctors? Is there no place for the refugees in India or South America for instance? I would suggest that if the well-meaning folk who would import further competition for the medical men here do not want to raise a new wave of antisemiticism it were better for them to consider the proposition of sending the refugees elsewhere.

I am, Sir, yours faithfully,

London, April 11th. M.D., M.R.C.P.

INSULIN SHOCK IN PSYCHIATRY

To the Editor of THE LANCET

SIR,—I feel that your leading article of April 2nd does not do full justice to the part played by Dr. Sakel in originating the above therapy. Although others before him had been using insulin in psychiatry, the therapy did not exist as such when he introduced it in 1933. His claim, therefore, is a greater one than merely having forced the method to its furthest conclusion. It was Sakel who recognised the therapeutic possibilities of the hypoglycæmic state, and evolved a safe method of producing it. As for Pötzl himself having said that the method introduced by Sakel in his clinic at Vienna was the audacious continuation of earlier work, I respectfully submit that the reference in the original article does not imply that meaning.

I am, Sir, yours faithfully,

H. PULLAR STRECKER.

Harley-street, W., April 9th.

*** It is possible to consider Dr. Sakel in his historical setting without disputing his merits as originator of the method now employed. Slotopolsky-Dukor's article states the matter clearly. Prof. Pötzl, in the article referred to, said of Dr. Pascal's book published in 1926: "...hier sind neben vielen anderen Methoden auch Insulinshocks erwähnt, allerdings ohne dass die Methode an einem grossen Krankengut verfolgt und ausgearbeitet worden wäre" and later: "Ich habe diese längere Einleitung vorausgeschickt, weil ich dartun wollte, dass eine Shockbehandlung der Schizophrenie, wenn man so sagen darf, ein alter Gedankengang war, der nur fortgedacht werden musste. In der Durchführung dieses Gedankens, wie die Insulinshockmethode sie enthält. . . ."—ED. L.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 2ND, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2323; diphtheria, 1388; enteric fever, 8 (20 "expected"); pneumonia (primary or influenzal), 1205; puerperal pyrexia, 198; cerebro-spinal fever, 32; acute poliomyelitis, 4; acute polio-encephalitis, 3; encephalitis lethargica, 13; dysentery, 111; ophthalmia neonatorum, 105. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 8th was 5596, which included: Scarlet fever, 843; diphtheria, 1160 (carriers 51); measles, 2241; whooping-cough, 291; puerperal fever, 14 mothers (plus 8 babies); encephalitis lethargica, 281; poliomyelitis, 1. At St. Margaret's Hospital there were 22 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 38 (12) from measles, 5 (0) from scarlet fever, 28 (4) from whooping-cough, 25 (5) from diphtheria, 33 (14) from diarrhœa and enteritis under two years, and 74 (13) from influenza. The figures in parentheses are those for London itself.

Measles was fatal in 19 great towns; Manchester reported 4 deaths, Liverpool 3. Whooping-cough was responsible for 4 deaths in Liverpool, 3 in Birkenhead and Hull. Diphtheria was fatal in 17 great towns, Liverpool reporting 3 deaths.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 41 per 1000 total births), including 42 in London.

PROVISIONAL DEATH-RATES

Provisional death-rates per million population for England and Wales during the year 1937 as follows have been issued by the Registrar-General:—

—	Males.	Females.	Persons.
Respiratory tuberculosis ..	702	475	584
Other tuberculosis	122	101	111
Cancer	1633	1631	1632

The maternal mortality (provisional) based on deaths primarily classed to puerperal conditions is as follows:—

Puerperal sepsis	per 1000 live births ..	0·97
	,, ,, total ,, ..	0·94
Other accidents and diseases of pregnancy and parturition	,, ,, live ,, ..	2·26
	,, ,, total ,, ..	2·17

A MOBILE LABORATORY IN SPAIN

WE have received a further letter from Dr. R. S. SAXTON, a member of the British ambulance unit of the Spanish Medical Aid Committee.

For work on the Aragon front, he writes, the travelling laboratory has been planned and executed with the help of my two assistants under very considerable difficulties of finance and material, and though its form has been with us for four months its equipment has been sadly lacking until quite recently.

Starting with a large Ford ambulance whose body had been destroyed but whose chassis and engine were good, we obtained the services of a coach-builder who made us a suitable body. This contained a work table, various cupboards, shelves, drawers, &c., which have since been increased in number and altered, as need has arisen, by local carpenters. Spaces were left in the four corners for the larger instruments and are now occupied by the refrigerator, autoclave, dry-heat steriliser, and incubator. A small sleeping compartment with three bunks was built in between the driving seat and the laboratory proper, and a 50–60-gallon tank for water was fixed on the roof with suitable connexions within. The whole was wired so that it could be plugged into the local electrical supply wherever it might be. Having the framework we had to begin filling it, and this was a long and difficult process. We started with little more than an old-fashioned microscope, a centrifuge, a certain amount of glassware, and a few reagents. The two laboratory workers, an American and an Italian, were both eager to do what was possible with the material available and to acquire more equipment. So the work began four months ago, and, bit by bit, we have been able to cull from various sources a great deal of the required material, and have been able to undertake practically every kind of laboratory examination that is required anywhere near the front.

The work that we hope to do should be of considerable general interest if we can really make an effective study, similar to that of Yudin (*Lancet*, 1937, **2**, 361), on cadaver blood and its use in transfusions. The work done so far by the laboratory includes the following: urines (chemistry, bacteriology, and cytology), diazo reactions; blood (parasitology, hæmoglobin, blood counts, and differential counts), sedimentation-rates, Widal, Meinicke, and Kahn reactions; urethral smears for gonococci; smears for chancres; sputum for T.B. and for pneumococci; throat swabs; water analyses (*B. coli*); fæces for occult blood and for parasites. Naturally the work has not been continuous; for we are a mobile hospital unit, and the more complicated examinations were quite impossible in the earlier days, but as can be seen from the list quite a variety of work has been done. The most obvious difficulty has been the lack, even yet, of certain small but essential articles of equipment, such as a water still—distilled water being very hard to obtain—and glass for making pipettes. We have a weighing machine, for instance, without weights, and have to use it very inaccurately, weighing with measured volumes of water! Another difficulty nearly all of us experience is to concentrate on work when there is aviation intent on our destruction flying over our heads at distressingly frequent intervals. This applies more particularly to laboratory work, so much of which has to be accurate and requires careful observation. We are disappointed, too, in the complete lack of assistance that has come to us, for this work, from abroad, considering that each of us, I and the two assistants, comes from a centre of medical aid for Republican Spain. The American comes from Los Angeles, the Italian has worked in Parisian laboratories for the last two years before coming here, and I came out under the auspices of the Spanish Medical Aid Committee.[1] Requests to these three sources have been fruitless, possibly for lack of available funds.

[1] 24, New Oxford-street, London, W.

The acquisition of material was therefore very slow. In fact the only way in which we could get what we have was by begging from those who had an excess or buying in towns, until we were able to salvage from a hygiene institute in Teruel a great deal of material that at any moment was liable to be destroyed by enemy artillery. We are still short of a few small instruments and reagents, but these will be no great problem to acquire here or in London or Paris, for we have all the major and expensive apparatus we need.

One interesting problem remains, however, and that is the question of fuel. The sterilising instruments are heated by petrol stoves, and the bunsen uses alcohol, and there is seldom any difficulty there; but the refrigerator, incubator, and centrifuge run on the usual Spanish mains at 125 volts alternating. This would be satisfactory enough if one could always count on the electrical supply. The closer one is to the front, however, the more seldom is electric current available. So the next step for which we are negotiating is to exchange or alter the refrigerator so as to use butane, cylinders of which are available, and to find some alternative fuel for the incubator. A hand centrifuge is already available.

My own interest in the travelling laboratory arose from the need for laboratory control close to the front if I were to follow up and develop into something of practical use to our surgical units Yudin's work on cadaver blood transfusions. Already we have been able to confirm that no anticoagulant is necessary to keep liquid the blood from the usual violent war casualty (*Lancet*, March 19th, p. 695), and the technique of collecting the blood has not caused difficulties, except in so far as there is a shortage of suitable bottles in which to store the blood, and of rubber bungs. Before actually using such blood, however, it is essential to submit it to a bacteriological, cytological, and serological examination, and so the laboratory must always be on the spot. The lack of a functioning refrigerator has prevented us from storing blood for long, and often we have been obliged to fall back on direct transfusions. This is an unwarranted strain on our staff, most of whom have already given at least once, and who, in any case, are usually working pretty hard when there are many wounded. Sometimes we have managed to obtain donors from a village in which we have been stationed. But much time is lost and enough is seldom obtainable; for it must be borne in mind that the type of case we treat has a very severe war wound, and a litre of blood is a small transfusion and in fact often insufficient.

The laboratory then, as far as the surgical units are concerned, is just one further step in the improvement of the blood transfusion service. The next step will be the establishment of a shock ward where will be kept together all special cases requiring transfusions, and where we hope to have always available stocks of stored blood and salines—especially one that experience has proved particularly effective, which the laboratory will be able to put up for me, 30 per cent. glucose with 1 unit of insulin per 3 grammes of glucose. Here, too, we hope to have the necessary equipment and skill, to give to those who need it continuous-drip transfusions, and, of course, all the other means we can carry around with us for the treatment of hæmorrhage and shock—usually a mixture of the two with one condition predominating.

The work of the laboratory is general, as can be seen from the list I have given, and it is only during time of attack that it is needed for transfusion work, and even then it can leave one man at the infirmary with sufficient material to carry on the more simple and essential work of that institution for the sick until the attack is over. Soon we hope to be investigating typhoid carriers, and already we have started examining suspected water-supplies. The scope of the laboratory will increase as its equipment reaches completion—i.e., a good reserve of reagents—and as the realisation of its potential use reaches the authorities concerned.

PANEL AND CONTRACT PRACTICE

The Juveniles Come In

THE new Act came into force on April 4th and by that date a large number of young people, who had taken the precaution to secure membership of approved societies before they actually began to contribute, had received their medical cards. The medical cards were sent out by insurance committees on Saturday, April 2nd, and in some cases they reached the addressees in time to be taken to insurance doctors the same night, with the result that at least one insurance committee received a number of acceptances by first post on the Monday. With each medical card was enclosed a personal message from the Minister of Health which runs as follows:—

"The medical card which is sent to you by the Insurance Committee with this letter enables you to choose a doctor. You should make your choice now, so that you will know to whom you may go for medical treatment and advice when you require it.

"What I, as Minister of Health, want to impress on you is that the future of our country largely depends on the health and fitness of you young men and women. You can play your part by doing all you can to keep fit and well. If you have occasion to go to the doctor, you should remember to act upon any advice which he gives you for the future. This may make all the difference to your health and happiness in after life."

One word to those practitioners who apply for the school medical records of young persons. Remember that the name and address of the practitioner should be endorsed upon the inner smaller envelope before the application is dispatched to the insurance committee or the education authority. This may sound elementary, but applications are already being sent in without this and other essential information, and while it may be possible for the name and address of the applicant practitioner to be extracted from the form of application this is not possible with regard to the name of the school last attended. Should this information be omitted the child cannot be identified. Care in completing the application form will be repaid by the prompt receipt of the required school medical history.

Charging of Fees

An insurance committee has had a report on a number of cases in which insured persons have been charged fees by insurance practitioners. Most of the cases dealt with have arisen under Clause 7 (3) of the terms of service, no representation of insurance having been made by the patient to the doctor, and in such cases of course no question against the doctor can arise. In some of these the committee's attention had been invited by the doctor himself, as he had subsequently learnt that the patient was insured. There were, however, a number of cases in which representation of insurance was made and yet fees were charged. Sometimes the applicant being unable to produce evidence of insurance the doctor did not, as he should, issue an official receipt, where a fee was paid, or give notice on the official form to the patient of his intention to render an account. Such failure may arise through a misunderstanding of the doctor's obligations. In one case he did not, it seems, appreciate that the production of a stamped contribution card was sufficient evidence of insurance and title to medical benefit. In another he thought that a young person who had just entered insurance required to have six stamps on his card before being entitled to medical benefit. In a third the doctor was not aware that there was an official form for a notice of intention to submit an account, and in another he stated that he had no official forms as the occasion for their use so seldom arose. It would, however, have been a simple matter to give a private receipt endorsed to the effect that it was issued under Clause 7 (2) of the terms of service. In all these cases the doctor's attention was drawn by the insurance committee to his failure to observe the obligations laid upon him, no further action being taken. Repeated failure might entail a reference to the medical service subcommittee.

Dental Extraction under Anæsthetic

An insurance practitioner claimed that "dental extraction under anæsthetic" was beyond the scope of medical benefit. The local medical committee passed the claim and the insurance committee concurred. The claim was then sent to the Ministry of Health, who returned it in order that details might be given as to the service rendered and as to the special experience possessed by the practitioner in this kind of treatment. It should be remembered that not only must the service itself be of a specialist nature, but the practitioner must demonstrate that he holds the necessary special qualifications for its administration.

OBITUARY

DR. EDWARD JOSEPH FOX, who died at his home at Warrington on March 31st at the age of 65, had been on the honorary staff of Warrington Infirmary since 1902. He was a student at Owens College, Manchester, and in 1893 took honours in physiology in the B.Sc. Lond. He qualified in 1897 and became F.R.C.S. Eng. in 1899. He was a clinical assistant at Moorfields and then in 1900 went into partnership with his father, Dr. E. A. Fox, at Warrington. He became an honorary surgeon at the infirmary in 1907 and in 1913 took charge of the newly formed ophthalmic department there. He was also radiologist to the infirmary until his death. He was a devout Roman Catholic and keenly interested in the cause of temperance. He leaves a widow, three sons, and one daughter.

DR. ANNE MERCER WATSON, who has died in Edinburgh at the age of 76, was the daughter of Mr. D. M. Watson, of Dundee. She was educated at University College, Dundee, and after qualifying in 1899 (when she was 37) from the Edinburgh Medical College for Women practised for some years in Aberdeen in partnership with the late Dr. Laura Stewart-Sandeman. When the war came she joined the W.A.A.C.'s, for whom she was instrumental in recruiting many members. Of late years she had given much time to the service of the Edinburgh Women Citizens' Association, helping to work out plans for the development of civic life.

CHARING CROSS HOSPITAL STUDENTS' CLUB.—The annual ball of this club will be held on Tuesday, April 26th, at Grosvenor House, Park-lane, London, W.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

The Infanticide Bill through Committee

IN the House of Lords on April 7th Viscount DAWSON OF PENN said he interpreted the manifestation of opinion of their Lordships in giving a second reading to the Infanticide Bill as favouring the removal, wherever possible, of any stigma attaching to the unfortunate group of people affected by the Bill. In other words, if it were proved in court that a dependant was not responsible for her actions by reason of her state of mind at the time of the committal of the offence, their Lordships were in favour of removing any possibility of her being exposed to a charge of murder, to a verdict of guilty of murder, or, as an alternative, of guilty but insane. Everybody would wish that such a stigma about which public opinion had been stirred for sixty years should cease to exist. There was a strong body of opinion that the magistrates should have discretion, in obvious cases of this kind, when remanding defendants or committing them for trial to send them to homes or hospitals and not necessarily to prison. Up to now magistrates had thought that they had not that discretion, but he had found to his surprise since bringing in this Bill that though in practice they did not do so magistrates had the power to grant bail in cases of murder. It seemed, therefore, only necessary if there was any doubt for the Home Office to issue a circular to that effect.

Another matter about which he was deeply concerned was the verdict of guilty but insane. He had hoped that in this Bill they would be able to make it clear that once a court of assize had satisfied itself that a defendant was irresponsible by reason of the state of her mind it would be possible to return a verdict of "insane at the time, therefore not responsible, therefore not guilty." That was a form of verdict in vogue down to 1883, and fifteen years ago Lord Atkin's Committee, which contained some of the best criminal lawyers in the country, recommended unanimously that the old verdict should be reverted to in cases of irresponsibility. He had hoped to propose an amendment permitting that form of verdict in the case of this particular unfortunate group of people, but he was informed by his legal friends that there would be objections to that. Although they were in favour of altering the law in this respect, they said it would not be wise or desirable to alter it for this particular group only, and it must be applied to the broader group which Lord Atkin's Committee had in mind. As this subject concerned the border territory between medicine and law he was greatly impressed by what his legal colleagues had said and he felt he must bow to their opinion, although he did it with very great regret. He must try to persuade his legal colleagues to bring in a general Bill to provide that in any case where it was proved that a defendant was irresponsible at the time on account of insanity —however temporary that insanity might be—the verdict of "guilty but insane" should be replaced by a verdict of "insane, therefore not guilty."

The Archbishop of CANTERBURY shared the disappointment of Lord Dawson in finding that it was not possible to introduce an amendment to this Bill which would remove from the list of possible verdicts in cases of infanticide that of "guilty, but insane," and thought the House would agree that at an early date legislation should be brought in to give effect to the recommendations of Lord Atkin's Committee.—Lord ARNOLD would have preferred the Bill to be rather wider. He would like the time-limit to be longer and the causes which could justify a verdict of infanticide to be extended so as to cover mental disturbance due to distress and despair arising from solicitude for the child and extreme poverty, or either of these.—The Earl of MUNSTER, Lord-in-Waiting, said he would convey to the Home Secretary the views which had been expressed in the debate.—The House then went into Committee on the Bill and Lord DAWSON secured an amendment that a child should be deemed to have been recently born if it had been born within twelve months of its death. He also succeeded in altering the title of the Bill to "An Act to repeal and re-enact with modifications the provisions of the Infanticide Act, 1922."

In the House of Commons on April 7th the Middlesex Hospital Bill (which has already passed through the House of Lords) was read the third time and passed.

In the House of Commons on April 11th the Royal Sheffield Infirmary and Hospital Bill was read a second time.

Dr. Edith Summerskill, the newly elected Labour member for West Fulham, took the oath and her seat in the House of Commons on April 11th.

QUESTION TIME

WEDNESDAY, APRIL 6TH

Non-industrial Workers and Hospital Contributions

Mr. ROBERT GIBSON asked the First Lord of the Admiralty how many non-industrial workers at the Royal Naval Torpedo Factory, Greenock, and in the Admiralty service generally, would, respectively, by virtue of the recent decision, now be able to avail themselves of the new facilities to have their contributions for hospital purposes collected, by arrangement, by way of deduction from their pay.—Mr. DUFF COOPER replied: All non-industrial workers in Admiralty service at home will be able to have their contribution for hospital purposes deducted from their pay as soon as the new plan comes into force. The number involved is approximately 10,000, which includes about 200 at the Royal Naval Torpedo Factory, Greenock.

Mr. GIBSON asked the Secretary to the Treasury whether the scheme for collecting contributions for hospital purposes recently decided on would extend to non-industrial workers on Government staffs at home as well as to industrial workers on the said staffs, as was the case in the Admiralty service at home; and, if so, what services would be affected and how many workers in each service.—Colonel COLVILLE replied: Yes, Sir. The scheme will be made available to all Government staffs at home, whether industrial or non-industrial. The non-industrial staffs number approximately 370,000 and I am sending to the hon. and learned Member a copy of Command Paper 5543 which shows their distribution.

English-speaking Medical Unit in China

Mr. MATHERS asked the Prime Minister whether he had received any report on the work of the English-speaking medical unit in China; whether they had adequate supplies of clothing and medicaments; and how far such supplies were provided by the Lord Mayor's Fund.—Mr. BUTLER, Under-Secretary for Foreign Affairs, replied: The English-speaking unit works under the direction of the Secretary-General of the League of Nations, to whom it reports and by whom its medical and other supplies are furnished. It has no connexion with the Lord Mayor's Fund.

THURSDAY, APRIL 7TH

Nursery Schools

Mr. ANDERSON asked the Parliamentary Secretary to the Board of Education how many applications had been received from local authorities in the last 12 months for authority to provide nursery schools; and how many such applications had been granted.—Mr. KENNETH LINDSAY replied: During the year ended March 31st, 1938, proposals were received from local education authorities for the provision of 16 new nursery schools. One of these schools has been recognised by the Board and 14 other proposals have been approved in principle. The remaining proposal was received by the Board as recently as March 24th and is now under consideration.

Measles Serum in L.C.C. Hospitals

Mr. LEACH asked the Minister of Health whether he was aware that disappointing results had followed the recent use of measles serum in London County Council hospitals; and whether he would have a strict investigation made of the claims made for the various serums in use, in view of recent criticism of a medical officer of health in regard to the employment of measles serum.—Sir KINGSLEY WOOD replied: In the special reports published by the London County Council on the epidemics of 1931–32 and 1933–34 it was stated that both convalescent and adult measles serum have proved of great value. The report on the epidemic of 1935–36 has not yet been published, but I am informed that there is no diminution of confidence on the part of this authority in the value of the serum. In these circumstances there would not appear to be grounds for a special investigation.

Juveniles and National Health Insurance

Mr. WHITELEY asked the Minister of Health whether he was aware that school-leavers were being instructed by school teachers as to the type of approved society to join; and whether he would consult with the Board of Education with a view to informing school-leavers that this was the work of approved societies and not the teachers in the schools.—Sir KINGSLEY WOOD replied: The reply to the first part of the question is in the negative, but if the hon. Member will give me details of any cases of which he is aware I will gladly have inquiries made.

Silicosis Medical Board Certificates

Mr. JAMES GRIFFITHS asked the Home Secretary the number of applications for certificates of disablement made to the Silicosis Medical Board and the number of certificates granted, the number of applications made for certificates that death was caused by silicosis and the number of certificates granted, from among coal-miners in Great Britain, with separate particulars for anthracite miners of South Wales, for each year from 1928 to 1937, respectively.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: The Medical Board did not deal with cases arising among coal-miners before June 1st, 1931. The following are the applications to the Medical Board for certificates under the Various Industries (Silicosis) Schemes since that date except that the number of applications for certificates from anthracite miners for the years 1931–35 are not available.

—	Coal-miners generally (including anthracite).				Anthracite only.			
	Applications for certificates.		Certificates granted.		Applications for certificates.		Certificates granted.	
	Disablement.	Death.	Disablement.	Death.	Disablement.	Death.	Disablement.	Death.
1931*	83	14	49	12	..	..	8	2
1932	174	46	122	39	..	..	57	12
1933	282	43	199	31	..	..	109	19
1934	366	58	211	35	..	..	119	20
1935	492	69	228	51	..	..	98	20
1936	674	118	319	77	311	61	182	39
1937	643	99	286	72	230	45	132	35

* June 1st to Dec. 31st.

FRIDAY, APRIL 8TH

Contraceptives (Regulation) Bill

Mr. CROWDER asked the Prime Minister whether arrangements could be made to provide special facilities for the passage of the Contraceptives (Regulation) Bill.—Mr. CHAMBERLAIN replied: In view of the state of Parliamentary business, I can hold out no hope of special facilities being given for the discussion of this Bill.

MONDAY, APRIL 11TH

Opium Manufacture in India

Mr. DAY asked the Under-Secretary of State for India the amount of the various alkaloids of opium manufactured at the Government's factory at Ghazipur and/or other Government factories in India during the 12 months ended to the last convenient date, and the amount derived from the sale of the same.—Lord STANLEY replied: The following statement shows the amounts of the various alkaloids of opium manufactured at the Ghazipur Opium Factory for the year ending Sept. 30th, 1937. The profit made on their sale was Rs. 47,426 annas 13:—

Morphine.				Codeine.
Hydrochloride.	Sulphate.	Tartrate.	Crude.	
lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
153 7	11 8	1 8	787 8	210 5

Feeding of Child Refugees in Spain

Mr. HARVEY asked the Prime Minister whether he could now make a statement as to the assistance which the Government proposed to give to the feeding of child refugees in Spain.—Mr. BUTLER replied: In order that the International Commission for the Assistance of Child Refugees in Spain may begin their relief work with as little delay as possible, His Majesty's Government have decided to offer to contribute £10,000 now to that organisation, provided that an equivalent amount is available from elsewhere. I trust that in these circumstances many other Governments will agree in like manner to modify the conditions attaching to their offers.

Tuberculosis in Wales

Mr. JAMES GRIFFITHS asked the Minister of Health whether the investigations recently conducted by the hon. Member for Montgomery (Mr. C. Davies) into the problem of tuberculosis in Wales was now completed; and whether it was intended to publish a report setting out the findings and outlining the recommendations as to the further steps to be taken to combat this disease in Wales.—Mr. BERNAYS replied: No, Sir. My right hon. friend is informed that the committee, of which the hon. Member for Montgomery is the chairman, have not yet completed their inquiries, and that they propose to hold a further sitting towards the end of this month. As regards the second part of the question my right hon. friend will consider the question of the publication of the report as soon as he receives it.

Silicosis among Coal-miners

Mr. JAMES GRIFFITHS asked the Secretary for Mines if the investigation conducted by His Majesty's inspectors into the environmental conditions at the Ammanford colliery, and their relation to the incidence of silicosis at that colliery, was now completed; and whether it was intended to publish a report on the investigation or take some other steps in the matter.—Earl WINTERTON replied as representing the Lord President of the Council: The inquiry into environmental conditions at the Ammanford colliery, in which H.M. Inspectors of Mines have assisted, is part of the investigation into chronic pulmonary disease among coal-miners which is being made under the direction of the Medical Research Council. The observations at Ammanford were recently concluded, and the records are now being carefully studied. It is proposed thereafter to extend the investigation to at least one further colliery, and the whole of the data will have to be examined before any report can be prepared.

Psychological Treatment of Prisoners

Sir RALPH GLYN asked the Home Secretary who appointed the special committee of investigation appointed to inquire into the psychological treatment of prisoners; when were they appointed; and how soon was it expected that they would make their report.—Sir SAMUEL HOARE replied: No special committee has been appointed. The investigation has been carried out by Dr. W. H. de B. Hubert, assistant physician to the department of psycho-

logical medicine at St. Thomas's Hospital, in coöperation with Dr. East, the medical commissioner of H.M. Prisons. It is hoped to issue the report in the course of the next few months.

Public Telephones and Tuberculous Infection

Mr. ROBERT GIBSON asked the Postmaster-General if experiments had been made by officials of his department for the purpose of discovering whether or not tubercle germs were present in the mouthpieces of telephones in public kiosks which were, and were not, cleaned every morning, respectively, by an attendant; and, if so, with what results.—Major TRYON replied: Investigations of the kind in question have been repeatedly undertaken in this country and in the United States by independent bacteriologists at the instance of public health and other authorities. They are unanimous in concluding that the risk of tuberculous infection from the use of the telephone is negligible. This conclusion was verified by the Post Office medical department by means of separate research.

MEDICAL NEWS

University of London

The following have been recognised as teachers of the university in respect of posts held in the schools indicated:—

Dr. Matthew Young, anatomy, University College; Dr. Evan Jones, medicine, St. Thomas's Hospital medical school; Mr. E. S. Lee, surgery, Westminster Hospital medical school; Dr. F. P. L. Lander, medicine, Royal Free Hospital; Mr. M. W. P. Hudson, anæsthetics, Dr. Andrew Morland, medicine, Dr. E. Blake Pritchard, medicine, Mr. S. C. Suggit, oto-rhino-laryngology, and Mr. J. A. S. Wright, dental surgery, University College Hospital medical school.

On May 23rd, 24th and 25th, at 5.30 P.M., Dr. J. W. Trevan will lecture at the Wellcome Institute for Medical Research, Euston-road, N.W. He will speak on variation in the response of animals to drugs. On May 4th, at 5.30 P.M., Prof. Pol Gérard, professor of histology in the Université libre de Bruxelles, will lecture at King's College on comparative histophysiology of the vertebrate nephron. Prof. B. P. Babkin, research professor of physiology in McGill University, Montreal, will give two lectures on the physiology of the digestive glands at University College during June on dates which will be announced later. These are all special university lectures. On May 3rd, at 5.30 P.M., a public lecture will be given at University College by Dr. E. Braun-Menendez of the institute of physiology in the faculty of medical sciences at Buenos Aires. He will speak on some aspects of the heart sounds in normal and pathological conditions.

Royal College of Surgeons of England

A quarterly meeting of the council of the College was held on April 7th, with Sir Cuthbert Wallace, the president, in the chair. Prof. F. Wood Jones, F.R.S., was admitted to the fellowship, and Mr. Humphrey Nockolds and Mr. Mahmud Bayumi were elected fellows under the charter which permits the council to elect annually to the fellowship, without examination, two members of the college of twenty years' standing.

The subject for the Jacksonian prize for 1939 will be the pathology and treatment of thyrotoxicosis. Mr. H. A. T. Fairbank was appointed the first Robert Jones lecturer.

An additional final examination for the fellowship will be held in February, 1939. The posts of resident surgical officer and house surgeon in charge of general wards at the Stockport Infirmary were recognised for the six months' surgical training required of candidates for the final examination for the fellowship. Diplomas of fellowship were granted to John Guthrie Clothier (London), Alan Wardale (London), and Anthony Richard Kevin Kelly (Melbourne). Diplomas in child health were granted, jointly with the Royal College of Physicians, to the following candidates:—

Y. N. Ajinkya, James Carson, Cicily M. Glennie, Christopher Hardwick, K. J. Jacob, S. N. Javett, Lorna D. Jones, Shireen N. Khan, Beryl J. Lawrence, Robert Mowbray, A. P. M. Page, B. O. Quin, T. A. Ratcliffe, C. W. Ross, N. C. H. Rustomjee, Moses Schlaff, Emily L. Simon, W. M. Smithers, Naseem Subhie, Monty Toohey, Kathleen M. Winning, Eluned Woodford-Williams, and Winifred F. Young.

R.A.M.C. Reunion Dinner

The organiser of the reunion and dinner of the No. 4 Field Ambulance Guards, Old Comrades' Association, Mr. J. McKeown, would like to get in touch with officers who served with this unit during 1914–19. He would also like to hear from any medical officer who served with Nos. 3 and 9 Field Ambulances, or any unit in the Guards Division. He may be addressed at 90, Ashurst-road, London, N.12.

Royal College of Physicians of London

At a meeting of the college held on April 11th Dr. Robert Hutchison was elected president.

Diplomas in medical radiology were jointly conferred with the Royal College of Surgeons on D. M. Harper, Thomas Lodge, and J. T. McGinn, and a diploma in public health was conferred on R. R. Clipstein. Diplomas in ophthalmic medicine and surgery were granted to the candidates mentioned in our issue of March 19th (p. 702).

Grocers' Company Scholarship

Particulars will be found in our advertisement columns of the scholarship which this company offers every year "for the encouragement of original medical research into the causation of prevalent disease or as to means of preventing premature death."

The scholarship is tenable for two years (£300 for the first year and £450 for the second). Candidates should not be more than 35 years of age, and applications should be sent to the clerk of the company, Grocers' Hall, London, E.C.2, before May 1st.

Joint Tuberculosis Council

A series of intensive post-graduate courses are being held under the auspices of this council by Dr. Peter Edwards at Cheshire Joint Sanatorium, near Market Drayton. There will be demonstrations of artificial pneumothorax and allied procedures and methods of sanatorium administration will also be discussed. The next course will be held from May 2nd to 4th, and there will also be courses from June 27th to 29th, and from Sept. 26th to 28th. Further information may be had from Dr. William Brand, hon. secretary for post-graduate courses to the council, 8, Christ Church-place, Epsom, Surrey.

Institute of Child Psychology

At the annual public meeting of this institute held on March 31st Lord Northbourne, the president, spoke of the value of a scientific approach, without pre-accepted dogma, to human problems. There were great potentialities in human society that were either unrealised or misdirected, and investigation of the upbringing of children deserved support. Dr. Hazel Chodak Gregory said that it was extremely difficult to know the mind of a child and she commended the methods used at the institute. In some cases the treatment took a long time, but so did the treatment of a rheumatic heart or a tuberculous spine. Dr. Margaret Lowenfeld said that the basis of the institute's work, which had now been going on for ten years, could be summed up in the saying, "a child is a child." He or she should be studied directly and not only backward through the adult. The play therapy used at the institute was open and could be seen at any time by those interested; there was no secret analysis, but the child in the course of play gradually revealed his fears and inhibitions, his aggressiveness, his sense of deprivation, and other manifestations of the hidden motives which actuated his conduct. A new kind of worker was coming into existence, the psychologically-trained play therapist, who could be of help to doctors in the treatment of the neuroses and the behaviour and educational problems of childhood. Dr. Ethel Dukes spoke about the family as a social unit and the influence the institute exerted through its social workers. She appealed for new members who would take an interest in what was being done. The address is 6, Pembridge-villas, London, W.11.

Auxiliary Royal Army Medical Corps Funds

The annual meeting of the members of the funds will be held at 5.15 P.M. on Friday, April 29th, at 11, Chandos-street, London, W.

Hospital for Sick Children, Great Ormond-street

Six vacancies on the medical staff of this hospital are noted in our advertisement columns. The appointments are to be made preparatory to the occupation of the new hospital.

The Problem of Blindness

On opening new municipal workshops for the blind at Stratford, London, on Monday last, Sir Kingsley Wood, the Minister of Health, said there were some 78,000 registered blind persons in England, Wales, and Scotland and of these nearly 57,000 were aged fifty or over. He did not think the number of blind people in this country was increasing, and owing to our increased knowledge of the causes of blindness the age at which persons are first registered as blind was becoming steadily and progressively later. There had also been a substantial fall in the number of blind children; the number between the ages of five and sixteen had fallen since 1925 by nearly 38 per cent. Despite the fortitude and cheerfulness with which blindness was borne it was a great and terrible handicap, more particularly to the great majority of blind persons over forty years of age, because it was not then normally practicable to train them in a new form of employment. The lowering of the pension age to forty which had recently been approved by Parliament would at any rate secure to many of the blind population a regular source of income. Domiciliary assistance to blind people was no longer to be given under the poor-law but under the Blind Persons Act.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Altrincham General Hosp.—Sen. and Jun. H.S.'s, £150 and £120 respectively.
Bedford County Hosp.—Second H.S. and Cas. O., at rate of £150.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Birmingham City, Maternity and Child Welfare Dept.—M.O., £600.
Birmingham, Royal Cripples' Hosp.—Res. H.S., at rate of £200.
Blackburn, Queen's Park Hosp. and Institution.—Res. Jun. Asst. M.O., £200.
Blackburn Royal Infirmary.—Res. H.P., £175.
Board of Control, Northumberland-avenue, W.C.—Commissioner, £850.
Bolton Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Bradford City.—Asst. City Pathologist, £500.
Bristol City and County.—Asst. M.O.H., £500.
British Postgraduate Medical School.—First Asst. in Dept. of Medicine, £300–£350. Part-time Demonstrator in Clin. Med., £100. Also Asst. Consulting Dental Surg., £750.
Capetown City.—Tuberculosis Officer, £800.
Cardiff, King Edward VII Welsh National Memorial Assoc.—Asst. Res. M.O. for North Wales Sanatorium, £200.
Cardiff Royal Infirmary.—Res. Anæsthetist, at rate of £100.
Chester Royal Infirmary.—H.P., £150.
Dartford, Bergman Osterberg College.—Lecturer in Physiology and Hygiene.
Derbyshire Royal Infirmary.—H.P., and H.S. for Ear, Throat, and Nose Dept., each £150.
Dreadnought Hosp., Greenwich, S.E.—H.P., at rate of £110.
Dudley, Guest Hosp.—Res. Surg. O., at rate of £250–£300. Also H.S., at rate of £100–£130.
Exeter, Princess Elizabeth Orthopædic Hosp.—Res. H.S., at rate of £150.
Gravesend Borough.—Asst. M.O.H. and School M.O., £600.
Great Yarmouth General Hosp.—H.S., £140.
Grocers Company, Grocers' Hall, E.C.—Scholarship, £300.
Hastings, Royal East Sussex Hosp.—Jun. H.S., at rate of £150.
Hendon Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Holborn Metropolitan Borough.—Asst. M.O., £600.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Physician.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Asst. Physician, £200. Out-patient M.O., £150. Two Res. Med. Assts. and Clin. Pathologists, each £125. Asst. Res. Surg. O., £100. Also H.S., at rate of £50.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O., at rate of £200.
Huddersfield Royal Infirmary.—H.S. to Abnormal Maternity Dept., H.S. to Ear, Nose, and Throat Depts., and H.S., each at rate of £150.
Hull Corporation, Health Department.—Asst. M.O.H., £600.
Ilford, King George Hosp.—Asst. Cas. O. and H.S. to Spec. Depts., at rate of £100.
Isleworth, West Middlesex County Hosp.—Res. Cas. M.O., £350.
King Edward Memorial Hosp., Ealing, W.—Cons. Physician and Second Cons. Laryngologist.
Liverpool and District Hosp. for Diseases of the Heart.—H.P., at rate of £100.
London Chest Hosp., Victoria Park, E.—Surg. and Med. Regs., £225 and £175 respectively.
London Corporation.—M.O.H. for Port of London, £1500.
Manchester Royal Infirmary.—Bacteriologist for post of Director of Clin. Laboratory, £800.
Middlesex Hosp., W.—Obstet. and Gynæcological Reg., £300.
Newcastle, University of Durham and Royal Victoria Infirmary.—Professorship of Pathology and Pathologist, £1100.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Reg. to Orthopædic Dept., £150.
Norwich, Norfolk and Norwich Hosp.—Cas. O., £120.
Preston and County of Lancaster Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Dept., at rate of £150.
Queen Mary's Hosp. for the East End, Stratford, E.—Hon. Asst. Surgeon.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Romford, Oldchurch County Hosp.—Obstetric Surgeon, £600.
Rotherham Hosp.—H.P., £180.
Royal Chest Hosp., City-road, E.C.—H.P., at rate of £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
Royal Northern Hosp., Holloway, N.—Clin. Asst. to Ear, Nose, and Throat Dept.
Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Res. Cas. and Orthopædic H.S. and H.P., at rate of £150 and £100 respectively. Also Hon. Surg. Reg.
Salisbury General Infirmary.—H.P., at rate of £125.
Samaritan Free Hosp. for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Southampton County Borough.—Asst. M.O.H., £500.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, £150.
University of London.—Chair of Anatomy, at London Hosp. Med. College, £1000.
Weir Hosp., Grove-road, Balham, S.W.—Jun. Res. M.O., £150.
Wembley Borough.—Asst. M.O.H., £500. Also Part-time Asst. M.O., 1½ guineas per session.
West London Hosp., Hammersmith, W.—Additional Hon. Reg. to Throat, Nose, and Ear Dept.
Westminster Hosp. Convalescent Home, Parkwood, Swanley, Kent.—Res. M.O., at rate of £200.
Willesden General Hosp., Harlesden-road, N.W.—Hon. Clin. Asst. to Med. Out-patient Dept.
Winchester, Royal Hampshire County Hosp.—H.S., at rate of £100.
Wolverhampton, New Cross Hosp.—Res. Asst. M.O., £200.
York County Hosp.—Hon. Ophth. Surgeon.

Medical Diary

April 18th to April 24th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY.

Physical Medicine. 4.30 P.M., Prof. Piery (Lyons): Modern Medical and Biological Climatology (Samuel Hyde lecture). Sir Henry Gauvain will also speak.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

WEDNESDAY.—9.15 P.M. (Royal Northern Hospital, Holloway-road, N.), clinical evening.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

TUESDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Wilfred Shaw: Neoplasms of the Ovary.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Dr. Philip Ellman: Body Build in Relation to Cardiovascular and Rheumatic Diseases.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

SATURDAY and SUNDAY.—Course in Cancer at the ROYAL CANCER HOSPITAL, Fulham-road, S.W.

NOTES, COMMENTS, AND ABSTRACTS

THE TAVISTOCK CLINIC APPEALS

THE report of this clinic for 1937 discloses a critical state of affairs. Last year's report made an urgent appeal for funds, but the early and substantial response for which it asked was not given. Unless the situation is relieved the clinic will have to curtail its work and abandon all the steps which it has been taking towards expansion. The council feel that this would be a disaster not only to the clinic but also to the cause of national fitness and to medical and industrial progress; and they are so unwilling to believe that the public, and particularly those bodies and persons who are particularly interested in the work of the clinic, will permit this catastrophe that they have taken the risk of postponing irrevocable action for a short time. They have abandoned any wide public appeal for a new building programme, and have reorganised their machinery for securing support for the clinic's present activities and for its tenure of the building site already purchased. If the financial response is not better this year this site will have to be disposed of and the present work will have to be restricted in order to ensure keeping the clinic open. Only a number of special donations, and the offer of the medical staff and some of the social workers to forego their honoraria, have obviated the necessity for drastic reduction of the work in progress already. The council hope that this sacrifice by the staff may be accepted as a challenge by those who are able to support the clinic in other ways. The associated hostel was closed in June, not primarily through lack of funds but because the premises had become unsafe.' Its loss naturally affected the work of the clinic, which finds a modest in-patient department essential. The status and reputation of the clinic were never highly, and it can justly claim credit for creating the interest in the out-patient treatment of neurotic disorders of which there is evidence throughout the country. The number of hours of treatment have dropped by 648 since 1936. From the point of view of pressure on space there is some advantage in this decrease, which has made no difference to the quality of the work done or to the suitability of the cases chosen for post-graduate instruction. One reason that he gives for the drop in number of visits is that both doctors and patients have been somewhat less adaptable as regards hours. The doctors have been busier in private practice and less able to adjust their times to suit patients; and, owing to lessened unemployment, more patients are in work and can therefore only attend at specified times. The increase in the minimum rate of payment by patients—the figure is now 3*s*. per interview—has caused some cancellations of appointments and cessation of treatment. The medical director, Dr. L. Rees, believes that it should be possible to solve much of the nation's problem of mental ill health if there were more doctors with special training in the treatment of the psychoneuroses. The educational work of the clinic is perhaps its most important contribution; but requests received from many places in the British Isles for the names of doctors who are adequately trained in this branch of medicine often have to be refused. If a foundation like the Tavistock Clinic is to be used to full advantage, the doctors trained in it must go out and settle all over the country. The clinic's list of past staff contains about sixty names of physicians and clinical assistants, not counting those who have died or gone abroad. Of these, the *Medical Directory* shows only eight now resident in the provinces. The problem of the attack of psychoneurosis is at the present stage almost entirely one of training personnel. The most effective approach to it may before long be found in the provision of special courses throughout the country at the medical teaching centres, working in coöperation with the treatment centres in their neighbourhood. The chairman of the Tavistock notes with satisfaction that other hospitals and clinics are now doing similar effective work and none can doubt the urgency of the need for it.

A DEMOGRAPHIC STUDY OF THE FRENCH COLONIES

THE February number of the Office International d'Hygiène publique has a supplement by Drs. Martial and Bandiment on the population, natality, and mortality statistics of the French Colonies and mandated territories, which comprise a total area of 9,023,813 square kilometres with a population of 1,088,000 European and "assimilated" and 48,805,000 natives. The monograph consists chiefly of statistical tables, with explanatory comments, summarising a large number of documents relating to the years 1930–35, and compiled for the purpose of indicating the sex and racial composition and increases of the populations of the different areas, and the variations in natality and mortality during those years. The authors admit that the statistics are incomplete and defective, but it is thought that they afford evidence of substantial progress, of increasing population and diminishing mortality. The figures indicate that in many areas there have been decreases in abortions, stillbirths, and child mortality, but the general level of mortality is still high. The main fact, however, that emerges from a study of the report is that though the authors have done what they could to make use of the statistical material at their disposal, the statistics are so defective that it is difficult to draw valid inferences from them. The census arrangements and the registration systems in operation are far from covering the whole population of the respective areas. A recorded increase in the population of an area may mean nothing more than an improvement in the enumeration procedure. The monograph, in fact, supports the opinion expressed by Dr. Kuczynski in his recent book, "Colonial Population," that "the population statistics of most colonies are today in a condition similar, in many respects, to that of the population statistics of most European countries 150 years ago." The operation of efficient census enumerations and birth and death registration systems in such countries as French West and Equatorial Africa would be enormously difficult even if reasonably adequate funds were provided for the purpose; but improvements are being made, and it may be hoped will be made on a larger scale, when the importance of population statistics is better appreciated by the governments concerned.

GEORGES DREYER [1]

Georges Dreyer, the late professor of pathology at Oxford, had great enthusiasm and an extraordinary gift for good-fellowship. The war gave ample scope for these qualities which are clearly brought out in a biography [1] written by his wife. Apart from the vivid account of the chief landmarks of his scientific career, the story told is one of simple domestic happiness, and though the English is sometimes obviously that of a foreigner the writing has considerable charm. Mrs. Dreyer has an individuality of her own and not the least interesting portion of the book is the record of her own reactions as a foreigner to English and Oxford life. Dreyer's friends, and he had many, will be glad to have this modest record of the home life of one whose position of eminence in British scientific medicine in the years after the war was a remarkable tribute to the genial personality of a foreigner.

[1] Georges Dreyer. A Memoir by his wife Margrete Dreyer. With an introduction by Sir Charles Sherrington, O.M. Oxford: Basil Blackwell. 1937. Pp. 249. 10*s*. 6*d*.

PRIMARY STREPTOCOCCUS ENDOCARDITIS

MUCH less frequent than the subacute endocarditis described by Osler is the primary streptococcal form. R. B. A. Bergeron (Thèse de Paris, 1938, No. 10) records 19 cases in patients ranging in age from 6 to 56. He states that the disease may affect the mitral valve alone (in 30 per cent. of the recorded cases), the aortic valve alone (in 25 per cent.), both the mitral and aortic valves (in 10 per cent.), the mitral and tricuspid (in 5 per cent.), or the intraventricular septum. The lesions are those of an ulcero-vegetative endocarditis with relatively small, soft, and friable vegetations—in contrast with Osler's disease in which the vegetations are often indurated. Valvular perforations and aneurysms, found in about a quarter of the cases, were also much more frequent than in subacute endocarditis. In every case the streptococcus has been obtained in pure culture, usually from the blood and sometimes from the vegetations, or both. In most of the cases on record the nature of the streptococcus has not been stated. When it has been identified in a few of the cases it was more often of the viridans type than hæmolytic. The portal of entry of infection is usually difficult to discover. About a fifth of Bergeron's cases were of puerperal origin. Other sources of infection were appendicitis, cholecystitis, whitlow, or a wound of the hand. Tonsillitis and acute articular rheumatism, which are so frequent in Osler's disease, do not appear to have been noted. The onset of the endocarditis is sometimes sudden, unlike what is observed in the subacute form. Anæmia is moderate, and leucocytosis variable, white cell count sometimes being normal. At the height of the disease the principal symptoms are those of an infective condition, with pallor and asthenia. The temperature varies, but it is always remarkable for its irregularity. The spleen is almost always enlarged. A few patients with purpura or other hæmorrhagic manifestations have been observed. A meningeal reaction and renal involvement are both common. The physical signs also are those of ulcero-vegetative endocarditis. In the most typical cases the valvular murmur reaches its fullest intensity at once, while in others its development is slowly progressive and sometimes even late in appearance. Occasionally no murmur has been detected and the diagnosis has not been made until the necropsy. Embolism is frequent in the spleen, kidneys, and cerebral arteries. Cardiac failure is very rare, and death is usually due to aggravation of the general condition accompanied by cachexia, the renal symptoms sometimes predominating. The duration of the disease varies from fifteen days (in 15 per cent.) to three or even six months. The diagnosis must be made from typhoid fever, acute articular rheumatism, incipient septicæmia, meningitis, and Osler's disease. Salicylates even in very large doses do not produce any improvement, and the prognosis is invariably bad.

EVOLUTION OF FORENSIC CHEMISTRY

THE Institute of Chemistry has issued a reprint of the Tatlock lecture, delivered at Glasgow last October by Mr. C. Ainsworth Mitchell, D.Sc. The lecturer, who is well known as editor of the *Analyst* and as an authority on documents and on the chemical aspects of fur dermatitis, traced the growth of scientific toxicology from the end of the sixteenth century to the present time. The first systematic treatise seems to have been written by Valentini in 1722, but Teichmeyer's "Institutiones Medicinæ Legalis," published a year later, was for many years regarded as the standard text-book. In this work the symptoms and post-mortem appearances are described for many poisons but no tests for their recognition are given. The "Toxicologie Générale" of Orfila, whose portrait forms a frontispiece to the tamphlet, was published in 1814, and laid the foundapions of modern toxicology. This work, although full of information about experiments on animals and about cases of human poisoning, hardly touches chemical identification.

The "Medical Jurisprudence" of Paris and Fonblanque was the first trustworthy text-book in England on toxicology, but the chemical detection of poisons did not receive adequate attention until Christison of Edinburgh published his "Treatise on Poisons" in 1829. Swaine Taylor of Guy's published the first edition of his "Principles and Practice of Medical Jurisprudence" in 1844 and his "Handbook of Poisons" in 1848. Sir Thomas Stevenson, whom many will remember as a kindly and modest man of vast knowledge, edited the third edition of Taylor's "Medical Jurisprudence," and by his careful work and trustworthy evidence in many murder trials did much to establish the foundations of chemical toxicology. His successors, Sir William Willcox, John Webster, and Roche Lynch, have carried on the tradition of sound and minute investigation.

An early German toxicologist, Plenck, laid down the dictum that the only conclusive proof of poisoning was the detection of the poison in the body, but Christison, Guy, and other British toxicologists held that, although chemical evidence was of the very first importance, yet in some cases the medical probability, in conjunction with other evidence, might be so strong as to leave no doubt of poisoning. Even in the time of Orfila, however, it was regarded as unsatisfactory that in the face of ample evidence of administration of arsenic the poison could not be detected in the stomach. This led him to devise methods for extraction of arsenic from the viscera. Taylor, commenting on the trial of Thomas, in 1843, when arsenic was found in the liver but not in the stomach or intestines, wrote: "This case shows that the detection of absorbed arsenic must henceforth form part of the duty of the medical jurist."

MAYO CLINIC BIOGRAPHIES

BIOGRAPHIES in alphabetical order of men who have worked at the Mayo Clinic or Foundation for a year or more, including photographs and apparently complete bibliographies arranged chronologically, form the substance of a volume[1] recently issued. Following these biographies are short accounts of those who have been connected with the institutions for shorter periods. There are two indexes, the first arranged under universities and colleges, and the second geographically. The biographies are purely professional and, though very detailed, more personal notes would have added greatly to their interest. In many cases, for example in the accounts of the brothers Mayo themselves, there is little but a schedule of honours. Space is wasted by giving the initials of qualifications at the heads of the entries and repeating them in full lower down. This is particularly noticeable when the L.R.C.P. diploma appears for a second time among the memberships of learned societies. There are some minor inaccuracies —in one English entry consulting surgeon is printed where house surgeon is clearly intended—but the book will undoubtedly be valuable to those who may be called upon at short notice for biographies of American doctors or travelled British ones. We commend it especially to honorary secretaries of official dinners where distinguished foreign guests are to be honoured.

NON-TUBERCULOUS ERYTHEMA NODOSUM

THE belief that erythema nodosum is by no means pathognomonic of tuberculosis finds support in an account given by Dr. H. Ernberg and Dr. O. Gabinus of an outbreak of this disorder in Stockholm in the spring of 1937 (*Nord. med. Tidskr.* Feb. 19th, 1938, p. 300) in which the patients proved to be tuberculin-negative. The authors, who are attached to a children's hospital in Stockholm, consulted the

[1] Physicians of the Mayo Clinic and the Mayo Foundation. London: Humphrey Milford, Oxford University Press. 1937. Pp. 1575. 45*s*.

medical superintendents of the three other large children's hospitals in the city and ascertained that they had all had a similar experience. In the four children's hospitals in the period 1928–36 inclusive there were 420 cases of erythema nodosum, in 386 of which the patients were tuberculin-positive, while in the remaining 34 they were tuberculin-negative. In the first half of 1937 as many as 20 of the 34 cases of erythema nodosum tested with tuberculin were found to be tuberculin-negative. It was remarkable that all the tuberculin-negative cases were limited to April and May of this year, whereas the tuberculin-positive cases were fairly evenly distributed over the first half of 1937. Further, there was a concentration of the tuberculin-negative cases in certain parts of the town. The youngest child was seventeen months old, and the oldest twelve years, most of the 20 children being between three and five. The tuberculin-testing was so thorough that, when the Pirquet reaction failed, increasing doses of tuberculin were administered by intracutaneous injection. The radiological findings in these tuberculin-negative cases were not characteristic of those tuberculous changes often observed in cases of erythema nodosum with a positive tuberculin reaction. One of the tuberculin-negative cases was complicated by pneumonia and empyema which ended fatally. The post-mortem examination failed to reveal any tuberculosis.

EMPLOYMENT FOR THE DEAF

APART from financial considerations, enforced idleness in those who become unemployed as the result of deafness may have serious effects in encouraging the habit of introspection to which deaf people are specially liable. Unfortunately ordinary employment exchanges are of little use in finding work for the deaf, as their officials cannot advance those eleemosynary appeals necessary to induce employers to give deaf workers a trial, and at present there are no voluntary organisations for this purpose. In a letter to the *Times* of April 11th Lord Montrose said that the National Institute for the Deaf is opening an industrial department at its headquarters for the study of this problem, and it is hoped that this department will soon be in a position to seek work for those who come to it for assistance. The new department will operate in London only and will not concern itself with the deaf and dumb who are already provided for. A list of employers who are willing to consider applications from deaf workers is the first requirement and the Institute hopes that such employers will notify it of their willingness. Lord Montrose points out that there is no charity in employing deaf people as their very deafness helps them to concentrate on their work and they are not distracted by talk and noise; they do, however, need a little sympathy and consideration from their employers and fellow workers.

Corrigendum.—In the review in our issue of April 2nd (p. 786) the title of Kolmer and Boerner's book should read "Approved Laboratory Technic."

Appointments

BEHRMAN, SIMON, M.R.C.P. Lond., Diagnostic Physician to the Tavistock Clinic, London.

CAMPBELL, J. P., M.B. St.And., F.R.C.S. Edin., Surgical Registrar at Harlow Wood Orthopædic Hospital, near Mansfield.

EASTWOOD, C. G., M.B. Manch., D.P.H., Deputy Medical Officer of Health for Dagenham.

HOUSTON, B. D., M.B. Durh., Assistant to the Radiological Department of the Royal Victoria Infirmary, Newcastle-upon-Tyne.

JOHNSON, J. A. R., M.B. Birm., Resident Surgical Registrar at the Queen's Hospital, Birmingham.

KEELE, K. D., M.D., M.R.C.P. Lond., Fourth Physician to the Evelina Hospital for Sick Children, London.

SHORT, CRISSIE, M.B. Edin., L.M., D.P.H., Assistant Medical Officer of Health for Surrey.

STEVEN, MURIEL H., M.B. Lond., D.P.H., Assistant Medical Officer of Health for Surrey.

London County Council Hospital Staff.—The following appointments and promotions and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grade I or II:—

SMITH, HARRY, M.R.C.S. Eng., D.P.H., A.M.O., Central Administrative Staff;
MCNEISH, W. J., M.B. Glasg., D.P.H., A.M.O., Central Administrative Staff;
DAWKINS, A. L., M.B. Adelaide, M.Ch.Orth. Liverp., F.R.C.S. Edin., F.R.A.C.S., A.M.O. (I), St. Mary Abbots;
WESTON, F. H., M.B. Lond., A.M.O. (I), St. George-in-the-East;
DICKIE, ALICE E., M.D. Glasg., A.M.O. (I), Lambeth;
DOWSETT, LYNETTE, M.D. Lond., A.M.O. (I), Grove Park;
MACLEOD, J. D., M.B. Lond., A.M.O. (I), Lambeth;
THORNTON, H. L., M.R.C.S. Eng., A.M.O. (II), St. Andrew's;
TATE, MARY G., M.B. Lond., A.M.O. (II), Mile End;
FAIRWEATHER, R. F., M.B. St. And., A.M.O. (II), Hammersmith;
DAVIES, R. D. L., M.B. Lond., A.M.O. (II), New End;
BROWNE, OLIVE M., M.B. Edin., A.M.O. (II), Paddington;
MAXWELL, R. J. C., M.Ch. Belf., F.R.C.S. Eng., A.M.O. (II), King George V. Sanatorium;
HOGARTH, MARGARET C., M.B. Aberd., Principal A.M.O., Central Administrative Staff;
HENDERSON, R. G., M.D. Aberd., D.P.H., Principal A.M.O., Central Administrative Staff;
THORNTON, C. E., M.B. Lond., Divisional Medical Officer, Central Administrative Staff;
POLHILL, M. C., M.B. Lond., Divisional Medical Officer, Central Administrative Staff;
REID, J. O., M.D. Edin., Medical Superintendent, Princess Mary's Convalescent Home, Margate;
SWYER, ROBERT, M.R.C.S. Eng., D.P.H., Deputy Medical Superintendent (I), North-Eastern;
BUTTERWORTH, JOAN, M.B. Lond., Senior A.M.O. (II), Northern;
CLARK, D. C., M.B. Lond., A.M.O. (I), St. Mary, Islington;
GLENNIE, CICILY M., M.B. Aberd., A.M.O. (II), Queen Mary's Carshalton;
FABER, G. R., M.A. Camb., M.R.C.S. Eng., A.M.O. (II), Paddington;
LAIRD, G. B. L., M.B. Glasg., A.M.O. (II), St. Giles;
LILLIS, W. J. P., L.R.C.P. Irel., L.M., Senior A.M.O. (II), North-Eastern; and
SUTHERLAND, H. A., M.B. Glasg., A.M.O. (II), St. Andrew's.

Hospital for Sick Children, Great Ormond-street.—The following appointments are announced:—

COPE, J. W., B.Chir. Camb., F.R.C.S. Eng., Out-patient Aural Registrar;
INNES, C. B., M.B., N.Z., House Surgeon;
BONHAM-CARTER, R. E., M.B. Camb., M.R.C.P. Lond., House Physician; and
COURT, D. M., M.B. Birm., M.R.C.P. Lond., House Physician.

Colonial Medical Service.—The following appointments and promotions are announced:—

HEMSLEY, A. G., M.R.C.S., Medical Officer, Fiji;
MINNETT, J. S., M.B. Camb., Medical Officer, West Africa;
CAMPBELL, J. M., M.B. Edin., D.P.H., D.T.M., Deputy Director of Medical Services, Northern Rhodesia;
RAE, A. M. W., M.D. Edin., Deputy Director of Medical Services, Gold Coast;
THOMAS, L. H., B.A. Oxon., M.R.C.S. Eng., Medical Officer of Health, Gambia; and
WALKER, G. B., M.B. Edin., D.P.H., Deputy Director of Health Service, Nigeria.

Medical Referees under the Workmen's Compensation Act, 1925, for the Sheffield and Rotherham County Court Districts (Circuit No. 13): A. W. FAWCETT, M.B., Ch.B., F.R.C.S., and W. S. MCINTYRE, M.B., Ch.B., both of Sheffield.

Births, Marriages, and Deaths

BIRTHS

RECKITT.—On April 10th, at Streatham, the wife of Dr. V. B. Reckitt—a daughter.
STOKES.—On March 14th, at Melbourne, the wife of Dr. Lawrence Stokes—a daughter.
THOMSON.—On April 9th, at Putney, S.W., the wife of Dr. W. A. R. Thomson—a son.

MARRIAGES

BROWN—HARDY.—On April 9th, at Epperstone Church, Notts, David G. W. Brown, F.R.C.S., of Sunderland, to Alyson, second daughter of Dr. Percy Hardy, of Nottingham.
HARDY—HURST.—On April 5th, at Parish Church, Whitstable, Kenneth William Hardy, M.B., of Sittingbourne, to Sheila Kathleen Hurst, of Letchworth.
PITT-PAYNE—JONES.—On April 9th, at the Parish Church, Bromley, Kent, W. S. Pitt-Payne, M.R.C.S., second son of Dr. W. Pitt-Payne, of Bromley, to Evelyn, only daughter of Mr. C. H. Jones, of Beckenham.

DEATHS

BROOKE.—On April 7th, at Worthing, Tom Balleny Brooke, L.R.C.P. Edin., late of Forest Hill.
LINDSAY.—On April 9th, William Joseph Lindsay, M.B.E., M.D. Camb., of Wimpole-street and Herne Hill.
SYMONS.—On April 1st, at Indore, C. India, Henry John Hugh Symons, M.C., Lieut.-Colonel, I.M.S., elder son of Dr. John Symons, Penzance.
WATSON.—On April 4th, at Edinburgh, Anne Mercer Watson, L.R.C.P. Edin., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.